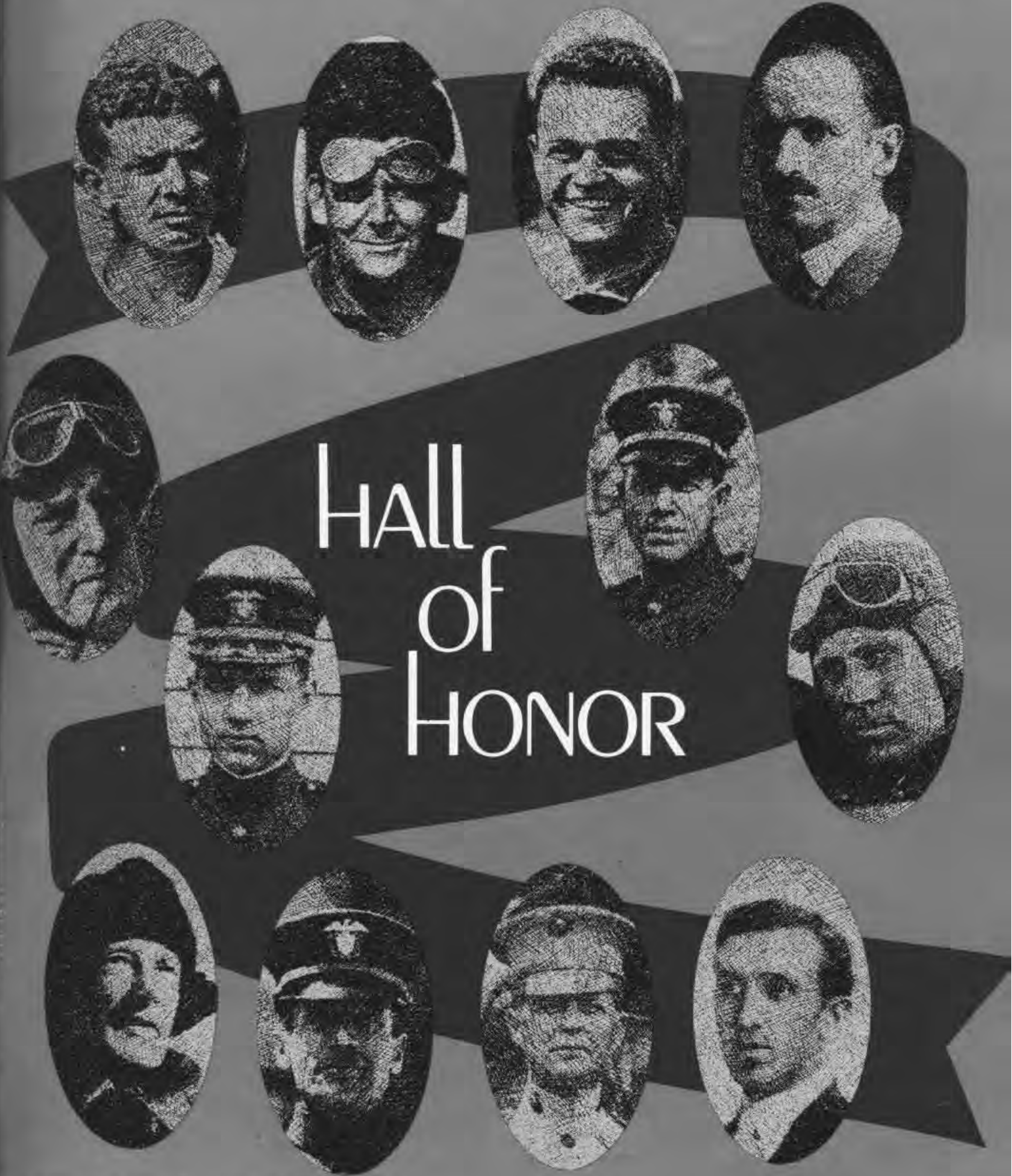
naval aviation news



Hall of Honor

January 1981


MT. SINAI

Joe Dulvick's TBM-3E provides cover during rain squalls at Grumman's 50th Anniversary celebration (See story, pages 26-33).

naval aviation news

Sixty-Third Year of Publication

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Front cover is a montage of the first 12 men to be selected for enshrinement in the Naval Aviation Hall of Honor, Naval Aviation Museum, Pensacola, Fla. Can you identify them? Their names are listed on page 48. Back cover shows the A-1, Navy's first aircraft in flight.

Features

Departments

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From the
EDITOR'S NOTEBOOK

U.S. Army Air Service DH-4

It seems that whenever someone comes up with a great idea that opens nev vistas and offers the human spirit a new sense of freedom, some spoilspor inevitably comes along to make rules which spoil all the fun. So it was with th horseless carriage and later with the flying machine. The War Department wa among the first to perceive a need for regulations governing the operation of th aeroplane. And this was perhaps a reasonable development, for many of tha department's early aviators were cavalry officers who saw a striking similarit between the mechanical Pegasus and their four-legged, hay-eating steeds. Thes official rules of 1920 are faithfully reproduced below, as a matter which may b of interest to present-day aviators.

Commencing January, 1920.

REGULATIONS for OPERATION of AIRCRAFT.

1. Don't take the machine into the air unless you are satisfied it will fly.
2. Never leave the ground with the motor leaking.
3. Don't turn sharply when taxing. Instead of turning sharp, have someone lift the tail around.
4. In taking off, look at the ground and the air.
5. Never get out of a machine with the motor running until the pilot relieving you can reach the engine controls.
6. Pilot's should carry hankies in a handy position to wipe off goggles.
7. Riding on the steps, wings, or tail of a machine is prohibited.
8. In case the engine fails on takeoff, land straight ahead regardless of obstacles.
9. No machine must taxi faster than a man can walk.
10. Never run motor so that blast will blow on other machines.
11. Learn to gauge altitude, especially on landing.
12. If you see another machine near you, get out of the way.
13. No two cadets should ever ride together in the same machine.
14. Do not trust altitude instruments.
15. Before you begin a landing glide, see that no machines are under you.
16. Hedge-hopping will not be tolerated.
17. No spins on back or tail slides will b indulged in as they unnecessarily strain the machines.
18. If flying against the wind and you wish to fly with the wind, don't make a sharp turn near the ground. You may crash.
19. Motors have been known to stop during a long glide. If pilot wishes to use motor for landing, he should open throttle.
20. Don't attempt to force machine ont ground with more than flying speed. The result is bouncing and ricocheting.
21. Pilots will not wear spurs while flying.
22. Do not use aeronauticle gasoline in cars or motorcycles.
23. You must not take off or land closer than 50 feet to the hangar.
24. Never take a machine into the air until you are familiar with its controls and instruments.
25. If an emergency occurs while flying, land as soon as possible.

DID YOU KNOW?

Up and Away This full-scale model of a vertical takeoff and landing aircraft was tested in simulated flight in NASA's Ames Research Center 40-foot by 80-foot wind tunnel. The Grumman design features engines that are positioned vertically for

helicopter-like takeoff and landing, rotating to horizontal (shown here) for conventional flight. This concept could be the forerunner of a new class of aircraft that will fly from small Navy warships instead of large aircraft carriers. It could also have civilian application in providing commercial flight to areas where there are no conventional aircraft runways. Testing is being done under a research and development program funded by the U.S. Navy, Grumman and NASA.

Aircraft Ski Jump A conventional Navy jet has completed a series of ski jump takeoffs in evaluation of ramps for carrier aircraft launching. A T-2C *Buckeye* raced up and off a three-degree incline July 31 to set the program in motion at the Naval Air Test Center, Patuxent River, Md. Navy test pilot Lieutenant Commander Steve A. Hazelrigg and a team of engineers from the Strike Aircraft Test Directorate are evaluating data gathered from the first series of jumps from the four-foot, two-inch ramp.

Next in the short takeoff and arrested landing (STOAL) concept demonstration is a four to five-month program to determine the optimum ramp altitude for takeoffs by T-2 and F-4 aircraft. A variable angle ramp which will adjust to three, six and nine-degree elevations is being developed by the Naval Air Engineering Center at Lakehurst, N.J. Evaluation of the variable angle ramp will begin in January. Bob Traskos, STOAL program manager at NATC, says the testing of the variable angle ramp will be extensive, with the *Buckeye* and *Phantom* logging between 20 and 30 launches from each angle.

LCdr. Steve Hazelrigg lifts off a three-degree ramp during tests with the T-2C Hawkeye.

The final phase, planned for mid-1982, will take the variable angle ramp aboard a carrier for tests involving the F-4 *Phantom,* S-3 *Viking,* E-2 *Hawkeye* and possibly the F/A-18 *Hornet.*

VC Shortfall

Civilian contractors are filling part of the reduction in VC operations caused by the decommissioning of VC-7, Miramar, and VC-2, Oceana, on September 30, 1980. The first civilian airplanes began operations on October 1 under a contract made by the Naval Air Systems Command for the purchase of 6,200 hours of flying time and the exclusive use of 11 Lear jets and Mitsubishi MU-2 turboprops for one year, with five-year options.

The aircraft will be available to the Fleet Air Control and Survey Facility for antisubmarine air controller, ASW, and track missions, and will be home-based at civilian airports within a twenty-mile radius of San Diego, Norfolk and Jacksonville. The contractor, Flight International, Inc., will furnish the aircraft, flight crews and maintenance.

Distinguished Service Medal

In a surprise ceremony aboard his flagship, USS *Midway*, Rear Admiral Robert E. Kirksey, Commander Battle Force Seventh Fleet, was awarded the Distinguished Service Medal for his efforts as commander of the U.S. Navy task force in the Indian Ocean.

Vice Admiral Carlisle A. H. Trost, Commander U.S. Seventh Fleet, made the presentation and praised RAdm. Kirksey's leadership of the Navy's Indian Ocean forces which have grown to a two-carrier, 25-ship, 20,000-man battle force sustaining a ready and capable U.S. presence more than 4,500 miles away from the closest major shore support facility.

RAdm. Kirksey attributed the outstanding operational ability of the battle force ships to the hard work and talents of the personnel on his staff and in the Indian Ocean Battle Force.

Grampaw Pettibone

Unconstrained Melody

The mission involved an F-14, F-4J and TA-4J to evaluate R&D aircraft hardware. A secondary mission of air-to-air tactics followed the T&E data collection. Several one-vs-one-vs-one engagements were executed before the F-14 reached bingo fuel and returned to base, leaving the F-4J and TA-4J to continue ACM tactics.

The F-4J, with leading edge slats installed, exhibited greatly improved turn capabilities and energy maneuverability, giving it an ACM capability more like that of the TA-4J than a standard F-4J.

The two aircraft began a one-vs-one engagement which degenerated into a horizontal scissors after two minutes of vertical maneuvering. The first horizontal scissors commenced with approximately 1,500 feet of lateral separation with the F-4J at 140 kias, the TA-4J at 170 kias. The closest point of approach (CPA) on the first scissors crossover was 368 feet. Maximum lateral separation expanded to 800 feet before positive closure was established, commencing the second horizontal scissors. CPA at the second crossover was 400 feet with aircraft at co-speeds (100 kias). Separation expanded to 1,000 feet before a positive closure vector was established. The third scissors commenced with 100 kias closing velocity.

Both pilots recognized an imminent collision and maneuvered *in extremis.* The F-4J went low and the TA-4J went high. They collided, with the TA-4J tail cone striking the F-4J fuselage in the turtleback section.

Although neither pilot was certain a collision had occurred, a "knock it off" was called. Subsequent airborne inspection of the aircraft revealed damage to the F-4J. Both aircraft returned to base without further difficulties where post-flight inspection revealed damage to the top of the TA-4J vertical stabilizer.

Grampaw Pettibone says:

Great jumpin' Jehoshaphat! Another eight bars of the ACM blues, the agony of it all!

This accident was just plain stupid. It occurred because none of these highly experienced crew members recognized the impending collision in time. Each participant allowed the dynamics of this ACM engagement to overcome his better judgment. These guys may have really been flying their aircraft but they danged sure had lost control of the situation. ACM rules of engagement have been established which, when adhered to, promote realistic, yet safe, air combat training. They are not expected to replace common sense, sound judgment, or professional maturity.

Gramps is a firm believer in the philosophy of "train like you fight," but there'll be very little left to fight with if we continue to train like this. At no time should ACM flight be pressed past the point of beneficial training. That point is where teaching and learning stop – and irresponsibility begins, all too often with disastrous fanfare! These gents were fortunate by only inches.

Old Gramps has seen many more serious accidents of this sort when common sense and guidelines were ignored. However, it's danged appalling when superior performance is overridden by unconstrained egos.

And that's the name of that tune. Please don't play it again, Sam.

ILLUSTRATED BY Osborn

Pettibone's Mailbag

Dear Gramps,

I am a Naval Reserve Officer and captain for a major commercial airline, with 23 years' aviation experience. On my drill weekends, I have access to *Naval Aviation News* and particularly enjoy G.P. The recurring accident themes I have read and continue to read prompted this letter. I sometimes wonder if we aviators will ever get it all together and reduce the accidents resulting from judgment, supervisory and pilot error. Specific recurring errors I have noted over my career cover a wide spectrum and include:

- supervisory disregard for Natops
- supervisors succumbing to the pressure of operational necessity
- supervisory disregard for aircrew fatigue

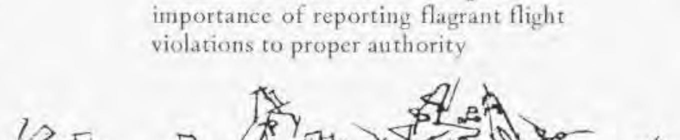
- aircrews flying low altitude routes with no idea of en route altitudes, topography or hazards
- aircrews who do minimum cross-country flight planning
- aircrews who consider only VFR conditions and are not prepared when IFR conditions are encountered
- aircrews who are in such a hurry to launch that they launch with a wingman who is marginally briefed
- aircrews who only nod in agreement with a flight weather briefer and do not ask questions about the content or significance of the briefing
- aircrews who, once away from home plate, perform flathatting or unauthorized flight maneuvers
- aircrews who do not use FSS metro en route
- aircrews who perform IFR section departures on cross-country flights with existing weather below minimums for a return landing should it be necessary
- aircrews who never question the pilot-in-command or flight leader just because he is senior or is the squadron Hot Rock
- aircrews who do not routinely use the takeoff, penetration or landing checklist
- aircrews who overstress aircraft and don't report it
- aircrews who won't admit when they are too fatigued to fly or emotionally upset by severe personal problems that make them safer on the ground
- aircrews who still suffer from get-home-itis
- aircrews who still confuse exceptional skill with faulty judgment
- aircrews who think a wave off or missed approach is a sign of weakness
- aircrews who fail to recognize the importance of reporting flagrant flight violations to proper authority
- aircrews who still fail to recognize SOP violations as indicators of poor pilot judgment vice superior piloting ability.

Hopefully, you can share this list with your readers and the minority it addresses will take heed.

I. M. Concerned

Grampaw Pettibone says:

Amen! Aircrews and supervisory types can use this list as a review of past and current problems. Read ye the list and heed this shipmate. He has spoken the truth! Perhaps it will be news to pilots and NFOs of recent vintage, but the aviation types referred to in this letter have been around a long time. Only their gravestones are different. Nowadays you gotta do more than kick the tires and twang the wires!



(Reprint from *NANews*, July 1977.)

NAVAL AVIATION

On July 10, 1980, the names of the first twelve distinguished men to be enshrined in the Naval Aviation Hall of Honor were approved by the Chief of Naval Operations. Most were early Naval Aviators but the list also includes the first Naval Aviation Observer and two civilians. All will be enshrined at a ceremony opening the Hall of Honor at the Naval Aviation Museum, Pensacola, Fla., on November 6, 1981.

The twelve were carefully chosen by a nine-man selection committee headed by Admiral M. F. Weisner, USN (Ret.), based on the following criteria:

- Sustained superior performance in or for Naval Aviation.
- Superior contributions in the technical or tactical development of Naval Aviation.
- Unique and superior flight achievement in combat or non-combat flight operations.

A bronze plaque will commemorate the achievements and special contributions of each honoree. In order of their selection, they are:

Admiral John Henry Towers, USN – Naval Aviator #3. A foremost pioneer of Naval Aviation. Chief of the Bureau of Aeronautics 1939-42 during which time he supervised the wartime buildup of Naval Aviation resources without the sacrifice of quality. A flag rank leader of Naval Aviation throughout WW II.

Eugene Burton Ely – Civilian pioneer of aviation. His flying career spanned a period of only about two years but included the first takeoff of an aircraft from a ship (USS *Birmingham,* Hampton Roads, November 1910) and the first landing-takeoff cycle of an aircraft to and from a ship (USS *Pennsylvania,* San Francisco Bay, January 1911).

Lieutenant Colonel Alfred Austell Cunningham, USMC – Naval Aviator #5. First Marine to be designated a Naval Aviator. Father of Marine Corps Aviation. First Naval Aviator to be catapulted from a warship while underway.

Rear Admiral Richard Evelyn Byrd, Jr., USN – Naval Aviator #608. Devoted more than thirty years to exploration of the polar regions, primarily the Antarctic, making many highly significant contributions to society.

Commander Theodore Gordon Ellyson, USN – Naval Aviator #1. Pioneer of Naval Aviation. Worked for acceptance of aviation in the Navy.

Glenn Hammond Curtiss – Civilian pioneer of aviation. Trained the Navy's first aviator. Introduced the first practical seaplane. Built the Navy's first aircraft (the A-1 *Triad*). Leading designer and manufacturer of aircraft during early stages of American aviation development. Made many significant contributions to early Naval Aviation.

Vice Admiral Patrick Nelson Lynch Bellinger, USN – Naval Aviator #4. Pioneer of Naval Aviation. A flag rank leader of Naval Aviation in WW II.

Rear Admiral William Adger Moffett, USN – First Chief of the Bureau of Aeronautics (1921-33). First Naval Aviation Observer. Played a major role in the between-wars struggle

A bronze plaque will commemorate the achievement and special contributions of each honoree.

HALL OF HONOR

to retain aviation in the Navy.

Rear Admiral Albert Cushing Read, USN – Naval Aviator #24. Pilot-in-command of the NC-4 during the world's first flight across the Atlantic in 1919.

Lieutenant Commander Godfrey deCourcelles Chevalier, USN – Naval Aviator #7. Commanded the Northern Bombing Group in France during WW I. First officer-in-charge of Aviation Detachment aboard USS *Langley*. Contributed significantly to early development of flight deck gear.

Captain Holden Chester Richardson, USN – Naval Aviator #13. Early aircraft designer. Designed hulls and supervised construction of the NC flying boats. A very "low profile" individual who contributed much to the engineering and design of early naval aircraft.

Warrant Officer Floyd Bennett, USN – Early Aviation Pilot. Pilot with Lieutenant Commander Richard E. Byrd on the first flight over the North Pole on May 9, 1926.

In the future, a maximum of six persons will be selected every year for enshrinement. The Director of the Naval Aviation Museum will receive nominations from all sources. OpNavInst 5750.10F of 22 September 1980 describes the procedures involved.

The Hall of Honor will be fitting tribute to those who led the way and to those who will follow in the proud traditions of Naval Aviation.

Artist's conception of Naval Aviation Hall of Honor.

1908

Admiral John H. Towers

By Helen Collins

When Admiral John Henry Towers retired on December 1, 1947, after 45 years of service, he could look back over a career that spanned the history of aviation. He was a leader among aviation pioneers and an active crusader for Naval Aviation. His unceasing fight to establish aviation's rightful place as an element of sea power did much to increase the striking power of the fleet.

One of the first three naval officers assigned to aviation duty, Towers reported in June 1911 to Hammondsport, N.Y., for flight training under Glenn H. Curtiss. His graduation from the U.S. Naval Academy in 1906 had been followed by the required two years of sea duty and he was one of the young officers in the Great White Fleet that circumnavigated the globe in 1907-8. He was commissioned as an ensign on February 13, 1908.

Towers told an audience at the Institute of Aeronautical Science in 1954 how he became involved in aviation:

"I was a young officer in the first dreadnaught of the fleet around 1910, very interested in gunnery. I found that ordnance had outgrown the ability of the personnel to use it, in that it fired over the horizon. We couldn't get high enough in the ship to see where the shots hit and that, frankly, was the beginning of my interest in aviation.

"The Navy was a very conservative outfit at the time I joined the fleet after graduation from Annapolis. When I began to show an interest in aviation, I was advised by my seniors to be awfully careful because many an officer had ruined his record by trying to be too progressive. Nevertheless, I decided I wanted to go into aviation and I made a formal application over the violent protest of my captain."

The reply to his request from the Navy Department read, "You are informed that your request has been noted and placed on file." Towers commented that in those days, that meant buried at Arlington.

However, Captain W. I. Chambers, who had been assigned to a desk in the Navy Department, was convinced that some demonstration was necessary to jolt the imagination of his superiors. He arranged for Eugene Ely, a Curtiss exhibition pilot, to fly a Curtiss plane off a platform built on the bow of the cruiser *Birmingham*, in November 1910. Two months later, the same pilot landed on USS *Pennsylvania* and then flew back to shore. Three months later, Glenn Curtiss himself flew his hydroplane out to USS *Pennsylvania* in San Diego Bay, landed alongside in the water and was hoisted aboard by a crane. Then lowered over the side, he took off from the water and flew back to North Island.

The Navy was convinced by these demonstrations and Congress appropriated the sum of $25,000 to buy three airplanes, two from Curtiss and one from Wright. Lt. Theodore "Spuds" Ellyson had already started flying instruction under Curtiss in 1910 and was joined by Towers in the spring of 1911. When a third officer, Lt. John Rodgers, was ordered to report to the Wrights for training, the Navy had its first air force of three pilots, with three planes authorized.

Towers described his first days in the world of aviation. "I proceeded to this little village of Hammondsport. When I applied for aviation duty, I had never even seen an airplane. I had been on sea duty after graduation on a cruise around the world when the Wrights were testing their plane. When I got ready to take my first lesson, I found that not Curtiss

NAVAL AVIATION HALL OF HONOR

This is the first in a series of articles on each of the first twelve men to be enshrined in the Naval Aviation Hall of Honor.

but Ellyson was going to instruct me — and he had just graduated and soloed the week before.

"We got the plane out just at daylight when there would be no wind. I had a 30-horsepower engine. Ellyson ran up and turned it around on the ground. He came back and said, 'It's all right. Take it. Push it all the way down. Don't worry. You can't get off.' I was scared to and was scared not to. And so I did. Halfway up the field, a little zephyr came along and the next thing I knew, I was 20 feet in the air. First time in my life I'd ever been in the seat of an airplane and I didn't stay there very long. I rolled the plane up into a mess of bamboo, wire and linen, broke an ankle and got all bruised up. Ellyson had overlooked a perfectly simple thing. The total equipment weighed only 500 pounds. The plane that couldn't get off the ground with him, flew like a breeze with me since I weighed 25 pounds less than he did."

Towers qualified as a pilot in August 1911 and about a month later the first aviation camp was established on the Severn River in Annapolis. Towers and Ellyson had the two Curtiss planes and Rodgers had the Wright plane. The Navy flyers set new records in the air, experimented in dual control and night flying, and developed techniques for military flying. It was a rickety air fleet. Accidents were frequent and crash personnel consisted of a couple of sailors in bathing suits.

Towers described their experiences at Annapolis. "The fellow who built that hangar, built it directly behind and in line with the midshipmen's rifle range. I don't know whether he had a dim view of the future of aviation or whether it was by chance. The midshipmen's idea of shooting was to get rid of ammunition. They didn't care whether they hit the targets or whether the ammunition went over the butts. Every shot that went over the butts landed either in our hangar or in our planes, but fortunately never in us.

"We never got any more money and our money was out. Ellyson and I were paying for the gasoline. We were paying for flying clothes. We were paying for everything that had to be bought and that we couldn't steal. We decided that we had to get away from Annapolis because we couldn't do much flying there. Wednesdays and Fridays, we had to vacate because of the rifle practice, and on Thursdays and Saturdays we'd have to repair the planes because we'd find bullets through the radiators, cylinder jackets, props and everything else."

That winter they got approval to accept Curtiss' invitation to go to Curtiss' winter experimental camp in San Diego. They arrived with three airplanes, four mechanics, one dog and a few other properties. Most of the work was trial and error. There were no engineers around. The Navy had none. Curtiss had none. He himself was not an engineer and the only way the flyers could find out about things was to try them out. Curtiss would put a wing of a particular curve on a plane and, if it didn't do well, he'd take a pencil and either thin it or thicken it here and there, and then someone would try it out.

In the spring of 1912, they went back to Annapolis but, instead of returning to the hangar, they camped alongside the Experiment Station which had all kinds of supplies. What the station wouldn't give them, the flyers and the mechanics could obtain by what Towers called "twilight requisition." During the following months, Towers went back and forth to Curtiss who was building some improved flying boats.

When the fleet went south in January 1913 for annual maneuvers, Towers was in charge of the Naval Aviation unit that deployed for the first time with the fleet, aboard a collier. He hoped to sell aviation to the fleet. Based ashore at Guantanamo Bay, the unit spent its time in experimental tests to coordinate aircraft with fleet operations. It demonstrated that airplanes could perform such duties as scouting and locating mine fields and submarines. Their experimental work included bombing, aerial photography and wireless transmission.

The following June, Towers was flying as a passenger in a two-seat, open cockpit plane with Ens. W. D. Billingsley as pilot. Planes were not then equipped with safety belts

Glenn Curtiss, left, and Towers in 1910 Curtiss plane.

nor pilots with parachutes. They were over Chesapeake Bay at about 1,700 feet when a downward air current struck the plane. Both men were thrown out. Billingsley was killed in the fall to the water below. Towers managed to grab one of the struts and fell with the plane into the bay. The aircraft turned over on the way down and landed on top of him as it struck the water but he held on until he was rescued. Curtiss visited Towers while he was hospitalized and, after listening to Towers' explanation of the accident and suggestions on how to prevent a recurrence, Curtiss designed the seat belt that is standard equipment today.

Left, Adm. John Towers, as drawn by cartoonist Milton Caniff. Below, ramp and tent hangars at Pensacola, where Towers was first OinC of the flying school.

The experiments in aerial scouting had had their impact in the Navy and, on the recommendation of an aeronautical board headed by Capt. Chambers, it was decided to create an aviation training school at the country's first naval air station in an abandoned navy yard in Pensacola. Towers' next assignment in 1914 took him there as executive officer of the station in charge of the flight school.

On April 20, 1914, less than 24 hours after receiving orders, an aviation detachment of three pilots (Bellinger, Chevalier and Smith), twelve enlisted men and three aircraft under the command of Towers, sailed from Pensacola aboard *Birmingham* to join Atlantic Fleet forces during the American occupation of Veracruz in Mexico. After one of their scouting missions, Bellinger came back with bullet holes through his plane. Soon after, Towers found some bullet holes in his plane, which he suspected were made with a screwdriver by his mechanics who would not allow him to be outdone by Bellinger.

By the end of the summer, Towers was at the American Embassy in London as assistant to the U.S. naval attache. There he remained until October 1916. With WW I going on in Europe, Towers learned firsthand the requirements for air power under combat conditions.

On his return, he became senior aviator in the Office of the Chief of Naval Operations and assumed duties which, with his later additional duty as supervisor of the Naval Reserve Flying Corps, gave him a leading role in the expansion of Naval Aviation.

There was an urgent need for patrol and scouting planes in WW I, and a shortage of shipping space led the Navy to design aircraft capable of making the transAtlantic passage under their own power. To complete these planes, assemble the necessary material and gather the personnel was Towers' assignment. On May 2, 1919, all was ready and Seaplane Division One, NCs 1, 3 and 4, were placed in commission by Cdr. Towers. Seven days later they took off from NAS Rockaway, N.Y., on the first leg of the flight. Towers' flagship was the NC-3 with Cdr. H. C. Richardson as pilot. NC-1 and NC-3 came down in heavy fog short of their goal near the Azores, to determine their position. Because of damage sustained in landing and extremely heavy seas, neither was able to take off again. The crew of NC-1 was picked up by the Greek steamer *Ionia* but the aircraft sank after several attempts to take her under tow failed. The NC-3 was damaged but the crew kept it afloat for 52 hours. Battling a heavy storm, they sailed the plane 200 miles to Ponta Delgada. The NC-4 completed the flight, all the way to Plymouth, England, making this the first transAtlantic crossing.

During the years between the world wars, Towers rotated in a series of administrative commands ashore and operational commands at sea, sitting in on many of the formative stages of Naval Aviation. Ashore, he built up equipment and developed techniques for dealing with the unique problem of operating aircraft in the marine environment. At sea, he put them to the test. From the early 1920s, he was a strong proponent of the aircraft carrier and in 1927 he was assigned as executive officer of the Navy's first carrier, *Langley*.

In 1929, while serving as assistant chief of BuAer, he became a member of the Advisory Committee for Aeronautics which had jurisdiction over research into the fundamental problems of aeronautics.

After a series of assignments as commanding officer of NAS San Diego, Chief of Staff to Commander Aircraft Battle Force and commanding officer of *Saratoga,* he returned to BuAer and in June 1939 stepped up to Chief of the Bureau as a rear admiral. He was the first of the Naval Aviators to achieve both the office and the rank.

As head of BuAer, Towers was responsible for the production and procurement of all types of aircraft. He was also responsible for the pilot training program, for the expansion of the air base system needed to support a larger force, for the construction of the ships required to take aviation to sea, and for the expansion of the aircraft industry to provide the aircraft and armament. The pilot training program which started during his administration began with rigorous athletic conditioning and admitted no compromise with quality even in urgent wartime expansion. During his tenure, total personnel assigned to Naval Aviation reached approximately three-quarters of a million.

Towers' promotion to vice admiral in October 1942 was followed by duty as Commander Air Force, Pacific Fleet. He was responsible for providing logistic support for all aviation units in the Pacific, including the Marine Corps, and for supervising their development, organization and training.

Towers then was made Deputy Commander in Chief, U.S. Pacific Fleet and Pacific Ocean areas. Although his functions were largely logistical and administrative, he shared in the development of strategy in the Pacific campaign. He particularly helped to implement the tactics by which enemy air and sea defenses were neutralized in a million-square-mile invasion area, while a new landing was taking place. The carrier took the offensive role which had been envisioned by Towers in early theory, destroying the enemy attack at its source. He inaugurated an intensive program to improve and coordinate Naval Air operations in the Pacific area and was largely responsible for organizing aviation components attached to carrier striking units which operated with such success against enemy forces.

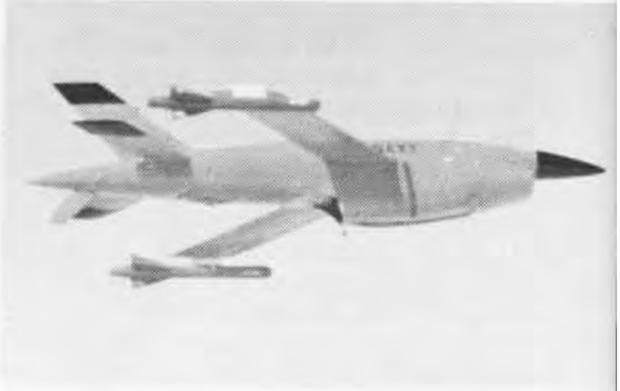
At the end of WW II, Towers relieved Vice Admiral John S. McCain as Commander Second Carrier Task Force, Pacific Fleet. On November 7, 1945, with the rank of admiral, he became Commander in Chief, Pacific Fleet/ Pacific Ocean Areas.

One year later, Towers returned to Washington to become Chairman of the General Board, a position traditionally reserved for the Navy's elder statesmen.

Towers was transferred to the retired list on December 1, 1947, but he remained active in aviation, first as a vice president of Pan American World Airways. In 1953 he became president of the Flight Safety Council in New York, and was actively directing work in this area at the time of his death at age 70 on April 30, 1955.

His long, distinguished career encompassed many firsts in Naval Aviation. It included the skillful direction of a fast-growing element of naval strength in time of war. His career extended beyond aviation to include command of the Pacific Fleet and the head chair at the table of advisors to the Secretary of the Navy. From the first, he carved his own individual niche in a field where all were pioneers.

Towers insisted that all members of his unit learn to swim well because they spent so much time in the water. This photo was taken at Guantanamo Bay: No. 1 Chevalier, No. 2 Cunningham, No. 3 unknown woman, No. 4 Towers, No. 5 Billingsley, No. 6 Herbster, No. 7 Smith, No. 8 Bellinger, and U.S. Vice Consul Morgan.



Droning on with

Far left, BQM-34A Firebee drone used to tow targets for gunnery exercises. Left, drones will be controlled eventually from a cockpit simulator using nose camera video information. Below, Sam Doran keys a left rudder signal on his remote control console to correct takeoff roll of QF-9 target drone at NAS Point Mugu.

Sam and Pat

By Commander Rosario Rausa

A drone is defined as "a pilotless airplane which is directed in flight by remote control." People at the Threat Simulation Department of the Pacific Missile Test Center (PMTC), Point Mugu, Calif., liken drone flying to "a true art." They ought to know. They have been operating drones since 1947 and have a staff of trained experts who probably know more about drone operations than any other unit in the U.S.

Drones have been in the Navy inventory since the 1930s, serving primarily as targets so that gunners ashore, afloat and aloft can hone their shooting skills. Today, the Navy operates QF-86 *Sabrejet* and QF-4 *Phantom* drones at Point Mugu, and two very dedicated and talented men are the keys to their successful use.

Assisted by a large number of professionals, Sam Doran and Jim "Pat" Patterson, perform all the remote control drone flying at PMTC. Both are former Naval Aviation Pilots, enlisted aviators, and each brings to his job a vast storehouse of knowledge and experience in the drone field.

They are a trim, agile pair, and project a lively love of flying which is manifested in the spirit that exists throughout the Threat Simulation Department. Both are in their middle 50s and each has about 6,000 flight hours. Sam hung up his uniform after 25 years of service, including early years as an aircraft mechanic in WW II. Pat served for 30 years on active duty, beginning as a radioman/gunner in SBD *Dauntless* dive bombers.

They are called Remote Airplane Pilots. They are the only two of their kind in the Navy except for one other man, Harlan Reep, who plies his trade at the Naval Weapons Center, China Lake, Calif. In addition to the QF-86s and QF-4s, Pat and Sam have operated the TD2C, F6F, F9F, F4U, F-84, T-33 and PB4Y.

Pat emphasizes that flying a drone "takes practice and motivation. And things can go wrong, just as with manned planes. Last year we launched a *Phantom*. I raised the gear and flaps but noticed the aircraft enter a gentle right turn. A chase pilot was airborne and tried to right it but the drone stalled and was lost."

"It's a precision operation," says Sam. "Even lining up the aircraft on the runway can be difficult. You have to concentrate as much as if you were flying the plane from the cockpit yourself, if not more so."

Pat remembers using drones for purposes far different than those common today. "We launched unmanned F6Fs loaded with 2,000-pound bombs and ran them into enemy tunnels during the Korean War," he said. "Did pretty well, too. I also once hit an enemy bridge with one."

A drone operates by responding to radio signals from a controller on the ground or in a chase plane aloft. It received the signals and responds through electronic devices which activate the controls – ailerons and rudder for turns, elevators for nose-up or down. The throttle is similarly activated to provide necessary power. In effect, all functions normally performed by the human pilot are duplicated.

San Nicolas Island lies 60 miles off the coast from Point Mugu in the blue Pacific (see accompanying story) and features a 10,000-foot runway from which unmanned drone aircraft are launched and recovered for missile and other tests. On a typical no-live-operator (NOLO) drone flight, Sam Doran rides the daily transport from Point Mugu to the island, dons his train engineer cap and mans what is called the Fox Truck or Mobile Control Van (he and Pat take turns on this type duty). The van is equipped with a remote control box, various switches for the throttle, landing gear and flaps, plus a control column which resembles the pilot's stick in the aircraft. The van is aligned with the runway centerline, well aft of the aircraft. The drone has been taxied into position by a qualified individual, not necessarily a pilot, who sets the trim tabs, engages the brakes, then disembarks.

Meanwhile, depending on the mission, a chase plane called Charlie One (sometimes two chase aircraft are used) is aloft, standing by to take control of the drone once it is safely airborne. The chase plane will control and "escort" the drone to the test area for its actual target run. In the master control building at Point Mugu – called "53" – Pat and other personnel from the Threat Simulation Department, including Commander Dan Turczyn, the Threat

Simulation Officer, monitor the action with a bank of recorders and related equipment. All hands involved in the mission are linked to a radio communications network — Sam in the van, Pat, Dan and the others at "53" and Charlie One.

After pre-takeoff checks are complete and clearance is issued from "53" and the control tower at San Nicolas, Sam actuates a switch which releases the drone's brakes. He then adjusts a simulated throttle lever and the drone begins to roll. Obviously, this is a sensitive movement, especially if adverse wind conditions exist. Sam must apply the proper amount of rudder and aileron during the roll to keep the drone aligned.

Once the aircraft is airborne, Sam flips more switches to retract the wheels and flaps. He adjusts power to establish the drone in a climb. Then, when the aircraft is safely away from the field and set up on a predetermined altitude, Charlie One is cleared to take control. He guides the drone to the warning area, a carefully monitored portion of sky where the actual run takes place. Charlie One takes a position well clear of the drone as it is tracked by fire control operators on a ship or a missile-laden aircraft pursuing the drone at altitude, whatever the case may be.

Since aircraft type drones are expensive, they are seldom used nowadays as targets to be destroyed. For the majority of missions, they're used for tracking and non-warhead firings in support of weapon system research, development, test and evaluation. Special smaller BQM target drones, also operated by PMTC personnel, are more commonly used for fleet training firing.

After the run is complete, the chase pilot rejoins his pilotless companion and guides it back to San Nicolas. The recovery process then begins, inspiring all hands toward a new dimension of concentration.

"I admit I get a little puckered up for the landing," says Sam. "There really isn't any room for mistakes."

The Fox Truck has been maneuvered to the side of the runway, positioned much like a landing signal officer. Charlie One makes his approach and positions the drone for a long straight-in. At a point about three to four miles from touchdown, gear and flaps extended, Sam takes over with a positive acknowledgement: "I've got it!" Charlie One transfers control to Sam and continues a course parallel to the runway, maintaining his altitude. Sam flies the bird to touchdown.

Once the bird is on deck and rolling out safely, he reduces throttle to idle. If necessary, Sam can drop the tail hook, enabling the drone to engage field arresting wires. But if conditions are normal the drone will be allowed to roll out and will be stopped at runway's end. The taxi pilot then climbs in and brings the aircraft back to the line.

"We couldn't stop an F9F at China Lake once," remembers Sam in a clear reference to the hazards of drone landings. "Something went wrong with the controls. It barreled off the end of the strip, continued for a mile and a half and finally came to a halt. Happily, it didn't explode and no one got hurt."

The Fox Trucks are gradually being phased out and all drone functions will eventually be performed from a cockpit simulator, utilizing video from a camera in the nose of the drone. This TV system, coupled with the integrated target control system, is now being used on QF-86s. It's a significant step forward and will streamline drone operations.

As in any flying, Sam and Pat point out that constant practice is required for efficient drone operations.

"We get just as stale as aviators after a leave period," says Pat. "If you're away from it for a while, it becomes especially difficult to maintain aircraft lineup for takeoffs and landings."

Interestingly, the QF-86 is not equipped with a basic autopilot, which means the remote pilot in a cockpit simulator must continually "fly" the drone without letup. The QF-4 *Phantom*, on the other hand, does have an autopilot and is thus easier to handle.

In case of malfunctions, warning lights illuminate in the control room "53" and decisions are made whether or not to continue a mission.

"Some time ago," remembers Sam, "a QT-33 was hit by a missile and a fire broke out in its wing. Charlie One felt the fire was minimal and recommended that we try bringing the aircraft back. I admired the pilot's motivation in wanting to save the plane but had to say no. A moment or so later the T-bird flipped over out of control and dove straight into the drink."

Fortunately, drones have a good safety record, approaching that of their manned counterparts. Neither Sam nor Pat can recall ever experiencing a jet engine flameout, for example.

Lieutenant Commander Max Wyckoff is assigned to the Threat Simulation Department as one of the aviators who actually fly drones for test and evaluation purposes. In effect, Max helps make sure they will react properly to remote control signal inputs. Max's background has been in A-4 *Skyhawk* and A-7 *Corsair* aircraft but he enjoys the challenge of drone pilot duty.

Above left, Grumman F6F-3K in flight under radio remote control, 1951. Above, this QF-86 has pilot aboard for test and evaluation.

A paddle-like extension is installed on the control stick in the drones. Max and his fellow pilots depress this paddle in flight when the aircraft is under remote control. By simply removing pressure from the paddle, they can obtain instant, personal control of the machine.

"I have to be confident in Sam and Pat," says Max, "and I am. But it takes a while getting used to riding along with someone else actually flying you around."

There is good rapport among the professionals in the department even though Sam and Pat tend to exploit the generation gap that lies between them and youngsters like Max.

"I wasn't even born when those two old pros started doing their thing in the air," says Wyckoff. "I can't even start a sea story without Sam or Pat topping it with one of their own. It's gotten so that once they begin a tale from long ago I just ease out of the room."

When you've been around Naval Aviation as long as Sam Doran and Pat Patterson and are as good as they are flying what some people call the largest radio-controlled model airplanes in the world, you're bound to have a grab bag full of unsurpassed sea stories. More importantly, Sam and Pat are performing a function vital to combat readiness in the fleet. They and their associates at Point Mugu are members of a valuable and productive team.

Early Drone Development

By Commander Rosario Rausa

Well before WW II, Navy planners identified a need for gunnery targets so that carrier antiaircraft artillery personnel could practice their skills. Sleeve-type targets, towed by long cables from aircraft, were not maneuverable enough. Officials wanted a target that could more realistically simulate an attacking enemy aircraft.

The first real impetus to drone development was provided by engineers at the Naval Aircraft Factory (NAF) in Philadelphia in 1936. Earlier experimental work was spearheaded by Lieutenant Commander, later Captain D. S. Fahrney, with a dedicated staff of civilian and military associates. Supplemental groups also worked at NAS Cape May, N.J., and at NAS San Diego. In later years, NADC Johnsville in Pennsylvania became an important site for drone development.

Project Dog was one of the first drone efforts at NAF. It was followed by Project Fox in 1938 which involved the conversion to radio control of N2C-2, NT-1 and Hammond single-engine planes. These early ventures were crude at best. The drones had no stabilization system and controls were activated by direct signal. However, LCdr. Fahrney and his people recognized the potential of drones and pressed on.

The first NOLO, or no-live-operator, drone flight took place in December 1937 at Cape May. By early summer 1938, radio-controlled drones were introduced to the fleet for gunnery exercises. USS *Ranger* crewmen had the honor of shooting at this first drone.

Drones also proved useful for different missions. In April 1941, 03Us were subjected to structural strength tests involving steep dives and high-G pullouts. In 1942 a TG-2 with a torpedo on board made a successful simulated attack on a destroyer which was maneuvering at 15 knots. Controlled by a chase plane 10 miles away, the TG-2 featured a television "eye" which transmitted a picture of the destroyer back to the chase aircraft. In 1944 *Hellcats* were used in tests to determine the degree of inflammability and fire hazard that could develop with possible ignition of jettisonable fuel tanks. Clearly, drone experimentation conducted without endangering human lives fortified belief in the value of pilotless aircraft.

The 03U had featured gyros controlled by photoelectric cells, operated with a shutter. Improved gyros were developed and enhanced stabilization. F4Bs and SBUs were soon in the drone business along with about 600 TDC-2s and, by the end of WW II, more than 100 *Hellcats*. TD2Cs, TDN-1s and TDR-1s were also built as drone aircraft. In 1946, the P-1K autopilot was ready and was most effective.

Operation *Crossroads*, which encompassed atom bomb tests at Bikini Atoll, took place in 1946. *Hellcat* drones were directed through the enormous radioactive clouds to collect air samples and data on velocity, acceleration and altitude changes which were encountered. The Army Air Corps also used B-17 drones during the tests. Perhaps more than any others, the Bikini experiments proved the value of drones.

As the years progressed, later model aircraft were devoted to drone operations. Activities in this field today are centralized at the Pacific Missile Test Center where talented people who operate them have full schedules, helping ensure that fleet gunners and flyers receive the most realistic combat training possible.

Left, the TDN was the first aircraft built specifically as a drone aircraft by the Naval Aircraft Factory, Philadelphia. Above, a 1930 New Standard NT-1 trainer converted to a drone by the Naval Aircraft Factory in 1937. Below, a 1938/9 drone converted from a Curtiss N2C-2 trainer. Originally a tail dragger, a nose wheel was installed on this aircraft for easier handling by the remote control operator.

From Relics

By Commander Rosario Rausa

The visitor stumbled on the sandy, pebble-strewn ground as he neared the edge of the cliff. Because it had been so quiet, the scrunching noise he created seemed unusually loud. Immediately, from the beach below the cliff, there arose a tremendous sound — a raucous yelping from a thousand throats. The visitor looked down and saw hundreds upon hundreds of frightened seals, sea lions and elephant seals, scurrying instinctively toward the surf, their enormous bellies jiggling in almost comical unison.

The lieutenant escorting the visitor saw nothing comical in the confused exodus, however. Rather, there was a trace of concern in his expression. "That's too bad," he said protectively, "we don't like to disturb the animals here. This is their home, their sanctuary."

The lieutenant was reflecting the collective attitude of all personnel assigned to San Nicolas Island, part of the Pacific Missile Test Center's (PMTC) Sea Test Range. That attitude is one of abiding respect for and appreciation of the natural environment.

San Nicolas has a fascinating past and an exciting present. "From Relics to Radars" is the fitting title of a booklet describing this 33-square-mile chunk of land which rises nearly 1,000 feet above sea level off the California coast about 55 miles southwest of Point Mugu.

About $30 million worth of communications and missile tracking instruments are positioned on the island. All of it functions in close coordination with similar equipment on the mainland at Point Mugu. Additionally, the 10,000-foot runway at the air facility has ground-controlled approach capability and accommodates pilotless drone aircraft, as well as a flow of regular aircraft.

San Nicolas Island is an integral part of PMTC's Extended Area Test System (EATS) and offers an unobstructed area over which the Navy can test and evaluate new weapons systems. EATS depends on instrumentation located on the island which allows testing to be conducted well beyond the island itself.

Most Pacific Missile Test Center activity is conducted over a rectangular plot of ocean 200 miles long and 80 miles wide, off Point Mugu. Detailed information on missile flights is obtained by radar, telemetry, photography and other means. Data, including the internal and external actions of the missiles, are then transmitted by telemetry to computers at Point Mugu, where teams of engineers and scientists study and digest the information. The San Nicolas complex supports about 20 operations of various types each working day.

Range users include Navy fleet units, the Departments of the Army and Air Force, NASA, and other government agencies. Test and evaluation groups at PMTC are, of course, prime users.

The network consists of three precision tracking radars of the FPS-16 type, one FPQ-10, and a highly accurate Cinetheodolite system with multiple locations on the island. There is also a well equipped and versatile telemetering center, as well as air and sea surface surveillance radars, communications facilities, ordnance storage, assembly and launch facilities, geophysical observations, frequency interference monitoring capability and a newly established laser test range.

Activities engaged in operations on the island include the naval facility (which is involved in oceanographic matters), detachments from Point Mugu's public works department, a permanent det from PMTC range operations, and the Outlying Landing Field, San Nicolas Island (OLF-SNI) unit. Altogether, the island population numbers about 200 civilian and 150 military personnel.

The OLF has air traffic control responsibilities and helps maintain overall security for range operations in support of


San Nicholas Island accommodates drone aircraft and other traffic.

to Radars

Aviation fuel and motor gasoline are transported in fuel trucks. Wells and springs on San Nicolas Island have been developed to supply all of the island's fresh water needs. A distillation plant, using a vapor compression system which converts sea water to fresh water, serves as a backup in case the ground water level or quality changes.

The island is rich in archeological evidence. Experts believe there may be more than 900 separate Indian sites there. The southern and western shores are the breeding sites for the endangered northern elephant seal and the California sea lion. One of the largest populations of seals and sea lions in the western U.S. thrives on the island.

Fortunately, the mammals are officially protected. The officer in charge of OLF-SNI is tasked with ensuring that the protection and the well-being of the animals are maintained by PMTC biologists. Various state-sponsored organizations work with the Navy in an effort to study the island's archeological treasures and preserve its environment. Natural resources are managed by a joint agreement between the Department of the Navy, Department of the Interior and the California Department of Fish and Game. All artifacts are protected by the Antiquities Act, which governs historical and prehistoric remains. Any excavation or collection of those artifacts must be approved by the Department of the Interior.

Historically, it is believed that Indians settled on the island long before the beginning of the Christian era. Spaniards are credited with discovering San Nicolas in the early 1600s. Unfortunately, hunters soon began ravaging the land, many of them seeking to gain from the rich stocks of sea otters that abounded there. The Indians suffered from diseases brought to them by the hunters and by the mid-1800s human life had virtually disappeared from the island. San Nicolas came under Navy jurisdiction by order of President Herbert Hoover in 1933.

One man who likes duty 55 miles offshore is the assistant officer in charge of Outlying Landing Field San Nicolas, Lieutenant John Murphy. He's a Naval Flight Officer with P-3 *Orion* time in his log book.

"It's a fantastic job," he says, "even though it's totally different from ASW duties. There is less operational stress involved than there would be as a TACCO on a P-3. But here, the challenges are unusual, exciting and unlike most others you'd expect in a military career."

Murphy finds himself involved in a variety of interesting activities, including missile tracking, archeological studies and ecological matters. "It's a once-in-a-lifetime experience for me," says Murphy. "You don't often get the opportunity to manage a piece of real estate like this."

Today, San Nicolas Island stands as a shining example of how man, even in his technological pursuits, can coexist with nature and nature's living wonders.

PMTC. Some of these duties include clearing and securing the impact area, providing escort services throughout the island for movement of weapons and explosives, assisting with all on-island emergencies and enforcement of good order and discipline.

A special service branch from OLF-SNI maintains a bowling alley, movie theater, gymnasium, recreation hall, softball field, handball court, library, pool room, hobby and lapidary shops and fishing boats. Additionally, there is an enlisted dining facility, a commissary, medical unit, Navy exchange and barracks.

All personnel commute to and from the island at the beginning and end of each week, or at other times as necessary, via a contracted commercial airline. A skeleton crew is on hand during weekends. Heavy cargo, aviation fuel, motor gasoline and diesel oil are brought to the island by barge. Oil is piped ashore from the barges to holding tanks.

Oldest Phantom II Squadron Becomes History

The Navy's first F-4 *Phantom II* squadron, VF-121, was decommissioned September 26 in ceremonies at NAS Miramar, San Diego.

The squadron was originally commissioned July 1, 1946, and designated VF-781. The *Pacemakers*, home-ported at NAS Los Alamitos, were one of the first Naval Air Reserve units. They were called to active service during the Korean War and 100 percent of the unit volunteered to go. The *Pacemakers* made two combat deployments in 1952-53, accounting for two MiG fighter kills during their second cruise.

Redesignated VF-121 on February 4, 1953, the squadron has flown F4U *Corsairs*, F9F *Panthers*, F11F-1 *Tigers* and F3H *Demons*. It was the first Navy squadron to receive the F-4 *Phantom II* all-weather fighter in 1961.

Pacemaker pilot Lieutenant Richard F. Gordon brought the Bendix Trophy to VF-121 by setting a new transcontinental speed record in an F-4. He later became an astronaut. Commander Pete Conrad, another astronaut, was also a *Pacemaker*. The unit won the Chief of Naval Operations Aviation Safety Award on four occasions, and in 1977 surpassed 30,000 accident-free hours in the *Phantom II*.

For the past 18 years, VF-121 provided a continuous program for training F-4 replacement fleet aircrews and maintenance personnel.

At decommissioning, the *Pacemakers* were headed by Commander Philip Anselmo.

First F/A-18 Squadron Commissioned

Fighter Attack Squadron 125, the Navy's first F/A-18 *Hornet* squadron, was commissioned in ceremonies on November 13 at Naval Air Station, Lemoore, Calif.

The squadron will train Navy and Marine Corps attack and fighter pilots to fly the *Hornet*, and also teach Navy and Marine Corps maintenance technicians to keep the aircraft and its sophisticated systems flying.

An estimated 25 Navy and 15 Marine Corps officers, and 121 Navy and 117 Marine Corps enlisted personnel will be aboard by September 1981. With a total complement of about 600 persons, VFA-125 will begin in mid-1982 to train fleet fighter squadrons transitioning to the F/A-18.

The *Hornet* is scheduled for delivery to the squadron in February. It is McDonnell Douglas' latest addition to the Navy's aircraft inventory, and is the Navy's newest aircraft. The *Hornet* will replace the F-4 *Phantom* and the A-7 *Corsair.*

Guest speaker at the commissioning ceremonies was Vice Admiral Wesley L. McDonald, Deputy Chief of Naval Operations (Air Warfare). Also present as distinguished guests were Lieutenant General William J. White, USMC, Deputy Chief of Staff for Aviation; Vice Admiral Robert F. Schoultz, Commander Naval Air Force, U.S. Pacific Fleet; and Rear Admiral Glen W. Lenox, Commander Light Attack Wing, U.S. Pacific Fleet.

Commander James W. Partington is the first commanding officer of VFA-125, and his executive officer is Marine Corps Lieutenant Colonel Gary R. VanGysel.

Photo by PH1 Terry M

naval aircraft

NAS Seattle, February 1943

1943

1943

"The design and construction work on (this) airplane nerally showed a higher degree of refinement than has en observed on previous airplanes of this class. This was flected in the performance, flying characteristics and ad-carrying capacity."

Readers who are familiar with Board of Inspection and rvey (BIS) reports, current and past, will recognize that takes an exceptionally fine airplane to merit these kinds words in a BIS report. The Boeing XPBB-1 *Sea Ranger* early WW II was that kind of airplane; the words above peared in the summary paragraph of BIS's April 1943 eliminary report. The final report, in June 1944, was not ite so laudatory, and the XPBB-1 did suffer from engine/ gine installation problems common to the early R-3350- wered aircraft of that period. However, test pilots and gineers associated with the *Lone Ranger*, as it came to known, remember it as "the best flying boat the Navy er had."

The story begins with a 1939 design competition for a v twin-engine, long-range VPB flying boat. Its special ture was to be that it could be catapult launched at high erload gross weights for extremely long range or endur- ce, or to carry heavy bomb loads. Sikorsky, by then com- ied into Vought-Sikorsky, produced the winning design. the industry rearrangements being made after the out- ak of WW II in Europe, the winning design was pur- ised by the Navy and the job of further developing a totype was turned over to Boeing. The Boeing design tured wings and tail surfaces whose aerodynamic tures were closely related to another new Boeing design tined to achieve fame as the B-29 *Superfortress*. The tract for the XPBB-1 was signed on June 20, 1940.

As the design developed, increased armament and fuel k protection were added, based on European combat erience. The final design incorporated five powered rets: nose, deck and tail with two .50-caliber machine s each and two waist turrets with single .50s. At the inning of 1942, with construction of the XPBB-1 well along, an order for 57 production PBB-1s was placed, to be built in a new plant at Renton, Wash., where seaplanes could be launched directly into Lake Washington. The XPBB-1 was to be completed at the new plant for initial flight testing.

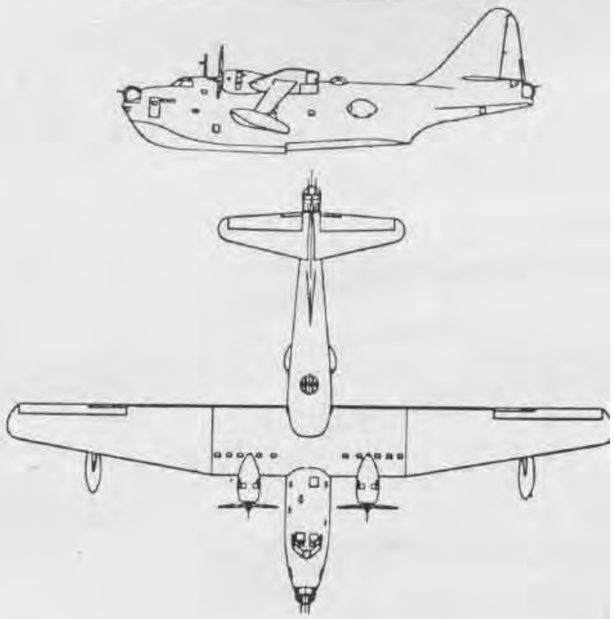
As first flight time approached, delays in deliveries of the Wright R-3350 engines and Curtiss-Wright propellers resulted in decisions to further complete the prototype from the stripped condition in which initial flight testing had been planned. First flight took place from Lake Washington on July 7. By this time, discussions were under way concerning transfer of the Renton plant to B-29 production, with the Navy acquiring earlier Army bombers as land-based VPB types. The exchange was decided, and the *Sea Ranger* was on its way to becoming the *Lone Ranger*.

Initial Navy flight trials were flown from NAS Seattle, at the other end of Lake Washington, in early 1943. The evaluation did turn up a good many items for correction, but the overall enthusiasm regarding the new boat's capabilities — including its hydrodynamic characteristics — led to renewed interest in possible production. In early fall, while the XPBB-1 was being readied for a ferry flight cross-

August 1943

Sea Ranger

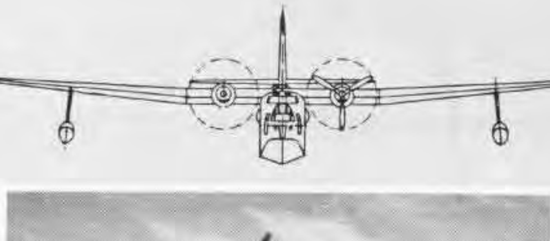
Span	139'8"
Length	94'9"
Height	35'
Engines	
Two Wright R-3350-8	2,250 hp
Maximum speed (clean)	215 mph
Service ceiling (clean)	18,200'
Maximum range	4,230 miles
Estimated for catapult takeoff-overload	7,240 miles
Crew	10
Armament	
Eight .50 caliber machine guns	
Up to twenty 1,000-pound bombs, or two torpedoes (external)	



country to NAS Patuxent River, Md., and delivery to the Navy, the Glenn L. Martin Company was requested to submit a proposal for an improved version with P&W R-4360 engines to be built in Baltimore as the P4M-1.

The magnitude of proposed changes continued to grow, and the proposed modified PBB was finally replaced in December with a new flying boat design, having provisions for auxiliary jet power units. By the time the XP4M-1 came into being, it was a land-based VP – only the R-4360 and auxiliary jet engines carried over.

The XPBB-1 reached Patuxent River in October and Navy tests continued there, including an extended test flight to Trinidad via Guantanamo Bay in early 1944. New design propeller blades were fitted to overcome limitations of the original blades. While damage from an engine nacelle fire in March was being repaired, the remaining trials, including planned catapulting tests, were cancelled in May. Some additional hydrodynamic tests finished up the testing. Having been barged from the old Boeing plant in Seattle to Renton for its completion and first flight, the *Lone Ranger*'s career ended as it began. The wings were removed and it left Patuxent River by barge for final scrapping.



1943

Afterburners aglow, the *Tomcat* flown by test pilot Chuck Sewell takes off into a gray sky.

The Eagles Return

There were lumbering TBM torpedo bombers and sturdy, little FM2 *Wildcats*, a big-bellied HU-16 *Albatross* amphibian and mosquito-like crop dusters.

An F6F *Hellcat*, with its engine snarling in a high-speed run, shared the air with a sleek F-14 *Tomcat*, in a reunion that brought together generations of Navy aircraft separated by 35 years.

The show was part of Grumman's 50th anniversary celebration at the Calverton, N.Y., facility on Long Island. On display and flying were more than 25 aircraft, many of them carrying U.S. Navy markings.

TBMs owned by (L-R) Joe Dulvick and Steve Ramsey pass in review on a high-speed run, top. At bottom, Dulvick's TBM-3E is one of the rare, restored torpedo bombers with the gun turret intact, here with wings folded on taxi-out. At right, Dulvick emerges from the cockpit of his TBM.

It was more than a gathering of aircraft. It was also a gathering of the men and women who flew them, and some who still fly them, from Vern Jobst who piloted the oldest aircraft, a J2F *Duck*, to Grumman chief test pilot Chuck Sewell in the Navy's F-14 *Tomcat*.

Art Kropp was a radioman aboard a TBM during WW II. He came to the anniversary as a crewman on Joe Dulvick's restored TBM-3E torpedo bomber.

"The plane is a time capsule," said Kropp of the restored TBM, which is one of few remaining with the original ball turret and .50-caliber machine gun. "We leave the ground

Left, crewmen turn the prop on the F6F *Hellcat* to check for oil in the lower cylinder. At top, the oldest aircraft at the celebration, a J2F *Duck*, presents a wide-angle view of the big pontoon and radial engine. Alexis DuPont, top right, passes low and slow with the hook down during the air parade. Lower right, with a puff of smoke, Mike Rettke's F6F *Hellcat* coughs into a roar.

and it's like going back 35 years."

He and Don Fleming, another of Dulvick's crewmen, flew together in the Pacific during WW II. "Not on the same aircraft," Kropp recalled, "but on the same strikes against the same targets."

Kropp flew off the aircraft carrier *Franklin* and Fleming flew from *Enterprise*. It wasn't until they met as crewmen for Dulvick 35 years later that they compared log books and noted the similarities.

Teddy Kenyon as a young woman in 1942 was a test pilot for Grumman. She smiled as she sat in the cockpit of Pete Parish's *Wildcat*.

"It was fun," said the diminutive lady who now runs a small business, building gyroscopes to steady optical equipment. "It was amazing how different two aircraft of the same type could be. You'd take one up and say, 'I love this one.' And the next time, you'd bring it back and say, 'Boy, they can have this one.' "

There was good-natured laughter among the pilots, starting with a flight briefing when Bill Rasmussen asked for one high-speed pass and one low-speed pass by the older amphibious aircraft, and a wag in the back of the room asked how he expected to tell the difference.

At a dinner the evening before the open house, pilots and crews were asked to stand and introduce themselves and say a few words. One man, with wry humor, announced his name

Top, its nose exaggerated by the camera lens, an F-14 is the focus of attention. Visitors look over a V/STOL model under testing for the Navy, at right. Bottom, test pilot Chuck Sewell taxis out in the F-14 for a flyby.

Story and photographs by JOC Kirby Harrison

and added, "If God had intended man to fly, he'd have given him a lot more money."

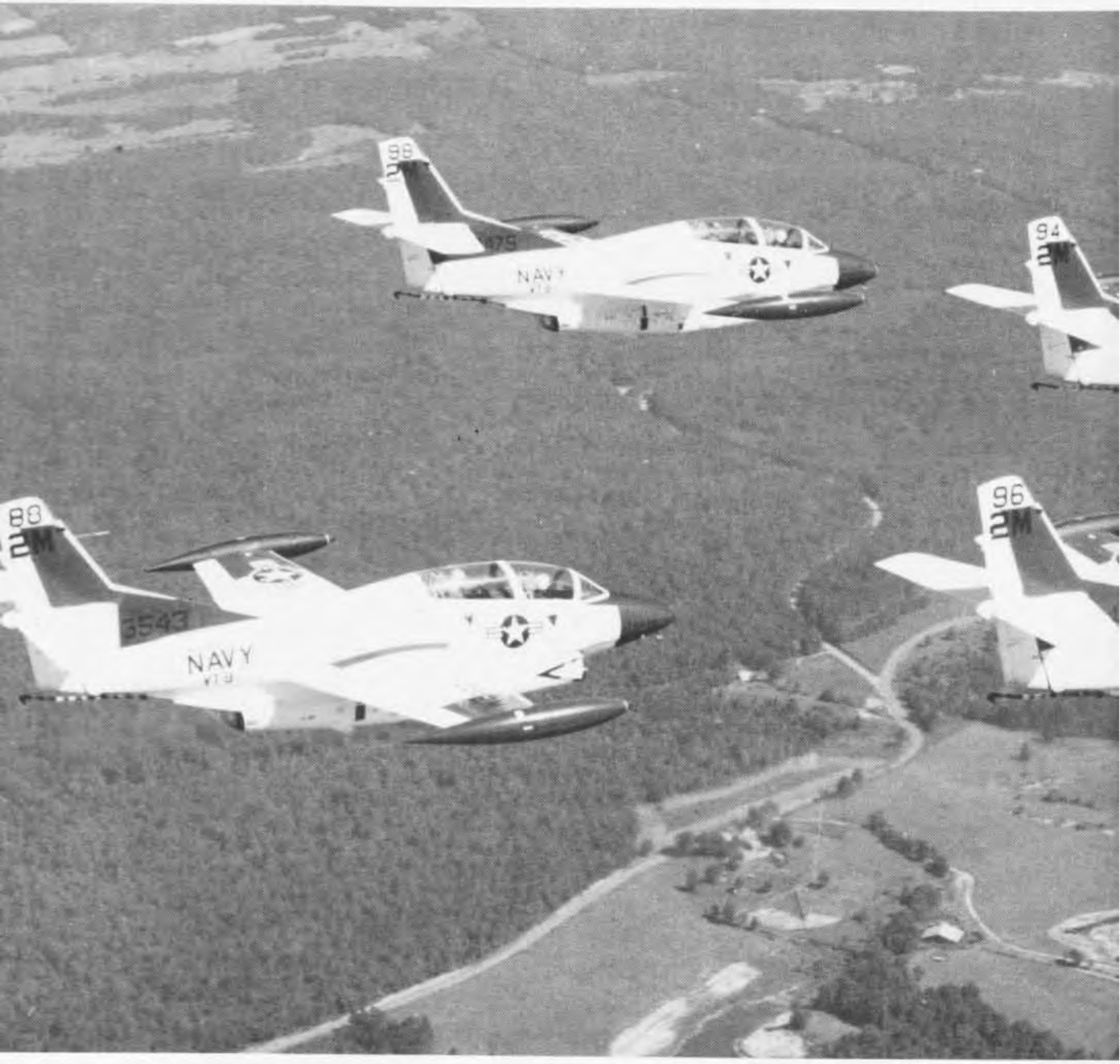
Despite the tongue-in-cheek presentation of this bit of wisdom, there is a serious side to that statement, according to retired Marine pilot Colonel Stanley "Chick" Challgren. "The sad thing is that 100 years from now, the only old aircraft people will see flying will still be these old prop jobs," he explained. "Nobody will be able to afford to renovate, maintain and operate the new jets they're flying today."

On Saturday, the crowd at Calverton field got less than the full flying parade as a cold front moved in with bad weather and the number of planes that could go up was limited.

Despite a heavy overcast that dissolved to rain, most of the 40,000 Grumman employees and guests stayed to watch as the F6F *Hellcat* flown by Mike Rettke made two passes and, with a friendly waggle of wings, disappeared into the clouds to find an alternate airfield with better weather.

And they stayed as the F-14 *Tomcat* lifted off the runway on a tail of flame and roaring afterburners, and angled steeply into the gray sky. The *Tomcat* turned quickly and was out of sight moments behind the *Hellcat*, and the sound trailed into the distance, replaced by silence.

Then, growing in the distance, came the sound of the F-14 and the ghostly, gray *Tomcat* reappeared alone.



NAVY
NAVY

A formation of T-2C Buckeyes produced at Columbus by Rockwell International.

NAVPRO COLUMBUS

By Commander William C. Stilwell

Last month, the Naval Plant Representative Office (NavPRO), Columbus, Ohio, celebrated 40 years of Naval Aviation service. Throughout this period, the many men and women of NavPRO Columbus have played an important national defense role as an essential link between the Navy and private industry. From a meager beginning, in a cow barn on the Ohio State fairgrounds, the office now administers a multimillion dollar government facility and a wide variety of contracts involving procurement of numerous and diverse weapons systems.

NavPRO Columbus had its beginning in December 1940 as the office of the Inspector of Naval Aircraft (INA), Curtiss-Wright Corporation, Columbus, Ohio. In those days, it was staffed by two civil service inspectors under the direction of one naval officer, Lieutenant H. R. Nieman. Six months later, however, construction of Curtiss-Wright plant number three in Columbus had progressed to the point where offices were available and INA moved from the fairgrounds to the Curtiss-Wright facility adjacent to the municipal airfield at Port Columbus. Dedication ceremonies were held on December 4, 1941, three days before the U.S. was rudely plunged into WW II.

By March 1942, the SO3C, a naval scout observation plane, completed its first successful flight and the first six SO3Cs were accepted for service. Later that year, the SB2C *Helldiver* was accepted by the Navy and large numbers of both of these aircraft were produced to satisfy wartime requirements.

The name of the INA office was changed in January 1944 to the Bureau of Aeronautics Representative (BAR). At about this time, Curtiss-Wright was operating at peak strength and BAR had also expanded to include 117 civil service inspectors, two aeronautical engineers and 20 clerks.

With the cessation of hostilities in the Pacific, however, production of planes dropped sharply and in June 1946 only three experimental models, the XBT2C, XSC-2 and XP-87 (Army) were under development. The Curtiss-Wright Corporation discontinued all operations in November 1950 and the Navy took title to several of the buildings, incorporating them into the Naval Industrial Reserve Aircraft Plant (NIRAP).

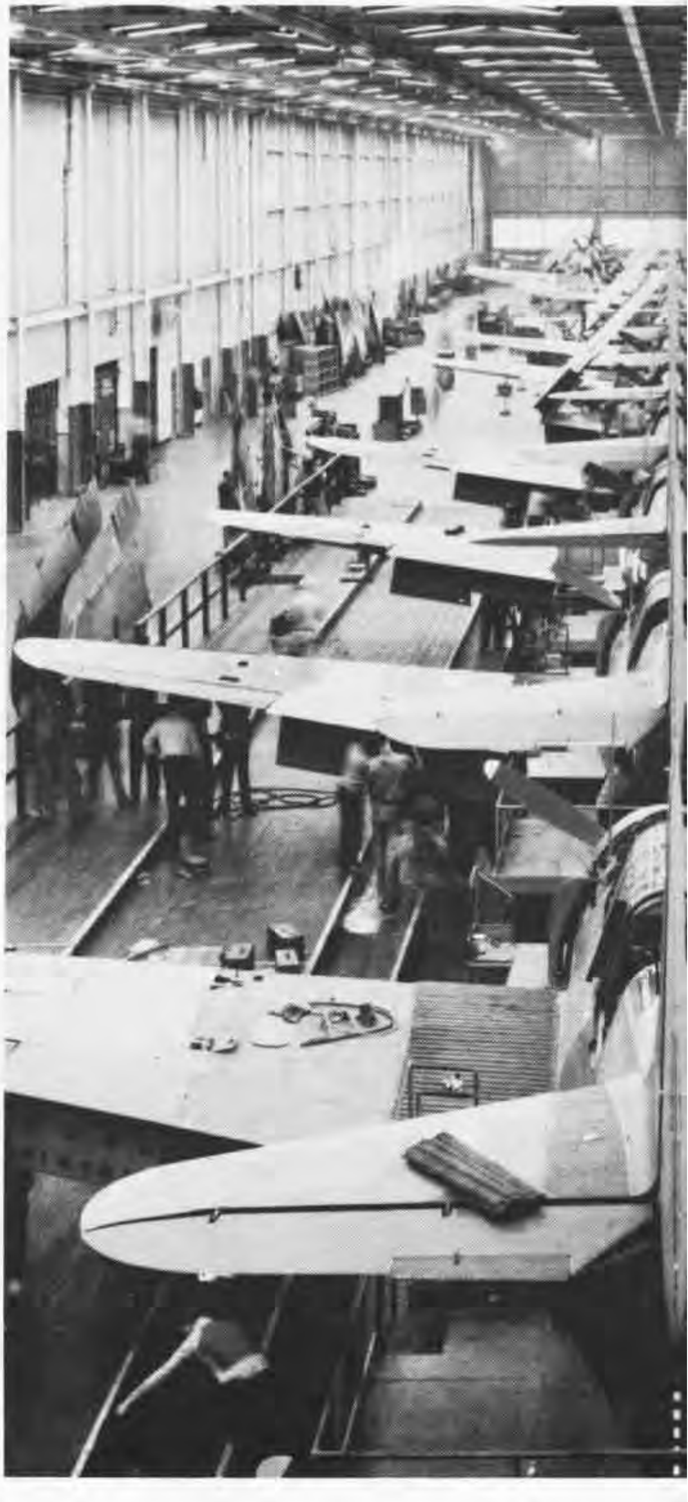
North American Aviation, Inc., started operations at NIRAP Columbus in late 1950. This company rapidly began producing F-86 *Sabre* jets, T-6G *Texan* trainers, AJ-2 Navy attack bombers and FJ series *Fury* jets. Throughout the decade, aircraft production rates remained high with introduction in 1955 and 1956 of F-100 *Super Sabres* and T-28 *Trojans*.

In the mid-1950s, North American began development of the T2J *Buckeye* and the A3J *Vigilante* which, along with the T-28 trainers, established a strong Navy-North American relationship. A missiles project group also played an essential part in development and production of weapons systems for the Army, Navy and Air Force.

Throughout the Sixties, North American Aviation continued production of T-2 and A-5 aircraft under the watchful eye of the plant representative, who now worked for the Bureau of Naval Weapons and was known as the BuWepsRep. Additional facilities were added to the plant, including a thermodynamics lab and transonic-supersonic wind tunnel. Development of the OV-10 began in 1964, adding to the aircraft program.

In June 1966, the BuWepsRep became the Naval Plant Representative Office (NavPlantRepO, later shortened to NavPRO). North American Aviation, Inc., became North American Rockwell and finally Rockwell International.

Declining production marked the decade of the Seventies. Although development programs were ongoing for the *Condor* missile, YOV-10D, B-1 bomber, Navy V/STOL (XFV-12A), Army *Hellfire* and Air Force GBU-15, no new



weapons systems entered production. As the number of company employees declined, so did the number of NavPRO personnel – from over 100 at the end of 1969 to 49 at the end of 1979.

The Columbus Aircraft Division of Rockwell International produced the last RA-5C in 1974 and by mid-1977 production of T-2s and OV-10s had also ceased. The Navy cancelled the *Condor* missile program in September 1976.

Today, NavPRO Columbus, with two naval officers and 41 civilians, is one of six similar organizations operating under the Naval Air Systems Command. Headed by Commander William C. Stilwell, the Columbus office administered contracts with Rockwell International totaling over $400 million last year.

Another important function of NavPRO Columbus is the administration of the Navy-owned Naval Weapons Industrial Reserve Plant located adjacent to the 10,700-foot runway of the Port Columbus International Airport. This aerospace manufacturing facility possesses all the elements for research, development, design and manufacture of missiles and aircraft weapons systems. NavPRO Columbus maintains this complex in a high state of readiness, ensuring that it can be brought on the line in the shortest possible time when and if it is needed.

Left, Curtiss-Wright turns out SB2C Helldivers at Columbus plant during WW II. Above, NavPRO Columbus today manages some 346 acres at Port Columbus International Airport.

PEOPLE · PLANES · PLACES

Can You Identify These Waves?

This photograph was taken on February 7, 1961, when the group arrived at NAS Pensacola for an orientation cruise aboard *Antietam* (CVS-36). The two Waves holding the banner served as military escorts for the visiting group, and *NANews* would like to

identify them. If you know who they are, please write: Editor, *Naval Aviation News*, Bldg. 146 Washington Navy Yard, Washingtion, DC 20374, or call autovon 288-4407 or commercial (202) 433-4407.

Et cetera

VA-95's LCdr. Art Critser, left, and RAdm. Robert F. Dunn, ComCarGru-8, paused for this photo after a flight together aboard *America* during the *Green Lizards'* last deployment. Together, they have amassed over 50 years of flying and logged over 2,600 carrier arrested landings. When asked about the flight, Critser replied, "I'm just glad to have flown with someone who came into the Navy before me. He's got me beat by 14 days!"

LCdr. Critser recently transferred from Whidbey Island to NTTC Corry Station, Pensacola, concluding a flying career of 28 years which encompassed 12,000 hours of flight time and 1,888 arrested landings. He enlisted in the Navy on June 15, 1951, and was designated combat aircrewman in January 1952, flying the PB4Y-2. His first carrier landing was in late 1953 while he was serving as radar operator in the AF. Critser received his Naval Air Observer Bombardier wings in 1961 as an AE1 and was designated an NFO in August 1969 as a CWO3.

Change of Command

Correction — The change of command for TacWingsLant, *NANews*, November 1980, should have read: NAS Oceana: Capt. Robert W. Jewell relieved Capt. Danny J. Michaels. RAdm. Douglas F. Mow is ComTacWingsLant.

CarGru-1: RAdm. Thomas F. Brown III relieved RAdm. William E. Ramsey.

HSL-33: Cdr. Robert "K" Doane relieved Cdr. Peter F. Navone.

HSL-35: Cdr. David A. Stull relieved Cdr. Richard L. Johnson.

VA-72: Cdr. Carter B. Refo relieved Cdr. Howard E. Koss.

VA-105: Cdr. Russell Pearson relieved Cdr. Robert Nutwell.

VC-8: Cdr. George W. Lundy relieved Cdr. John A. Skrzypek.

VR-53: Cdr. Joseph A. Montanaro relieved Capt. Malcolm K. Hunter.

VR-57: Cdr. Bobby G. Patterson relieved Cdr. John E. Bentley.

VS-30: Cdr. R. L. Shurts relieved Cdr. Robert Thompson.

Honing the Edge

As aircraft maintenance coordinator, the decisions are demanding, the pressure seems unending and often the billet itself appears to be thankless. All the Navy asks is that one man manage about 160 people to maintain 12 aircraft with limited parts to support a demanding flight schedule under arduous conditions. That anyone would accept this job would undoubtedly amaze some people in the civilian world, but there are men who seem to thrive under these conditions. AVCM Frank Waite of VA-122, Lemoore, is such a man. But his responsibilities are even heavier than those mentioned. Assigned 24 A-7Es and 23 TA-7Cs (not to mention a T-39, recently T-28s and soon OV-10s), Master Chief Waite has performed some amazing tasks. He has been awarded his second Navy Commendation Medal and the numbers written in the justification are impressive. Waite accepted a department manned by 484 people, maintaining 38 A-7s at an operational rate of 50 percent. Within a year, the manning was cut to 370 but the number of aircraft was increased to 47. He turned this challenge into an average operational ready rate of 80 percent. He gives credit to all the squadron maintenance personnel, particularly the shop supervisors. But the squadron feeling is that "when it seemed as if only a miracle could pull us through, Master Chief Frank Waite reported for duty." In photo, Waite checks VIDS boards with ADAN Tommie King of VA-122 maintenance control.

Professional Reading

Wragg, David. *Wings Over the Sea: A History of Naval Aviation*. New York: Arco Publishing, Inc., 1979. 224 pp. $17.95.

A good overview of naval aviation history on an international scale. Begins with early experiments in powered flight and describes Eugene Ely's 1910 flight from USS *Birmingham* but points out that the British were the first to establish a maritime air branch. Discusses the emergence of other naval air arms and the use of the airplane in WW I. Continues through the development of the aircraft carrier and describes its role in WW II. Brings naval aviation up to date with the modern jet, the nuclear-powered aircraft carrier and the development of V/STOL aircraft. Liberally illustrated.

Tillman, Barrett. *MiG Master: The Story of the F-8 Crusader*. Annapolis: The Nautical and Aviation Publishing Company of America, 1980. 224 pp. $17.95.

A comprehensive history of the F-8 *Crusader* from its conception through testing, evaluation and service with the fleet. A considerable portion of this book is devoted to the *Crusader's* outstanding performance in Vietnam and its record of 19 MiG kills. Discusses the continuing use of this aircraft by the U.S. Navy and others, and devotes one of seven appendices to the follow-on F8U-3. An excellent treatment of this well-known Navy fighter. Over 70 illustrations.

Milestones in Naval Aviation, 1919-1980: A Pictorial Calendar for 1981. Annapolis: U.S. Naval Institute, 1980. $6.95.

Traces seven decades of Naval Aviation history through black and white photographs and short narratives concerning the people and events depicted. Begins with the early efforts of Captain Washington Irving Chambers and ends with carrier operations in the Arabian Sea. Additional reminders of historic dates appear on calendar pages. Well illustrated with over 100 photographs.


NAVY

SEA DART

By Tom Hull

Tom Hull is a flight test engineer in the Flight Systems Branch, Strike Aircraft Test Directorate at NATC Patuxent River. Through his involvement in the restoration of the XF2Y-1 (BuNo 137634) for the Naval Air Test and Evaluation Museum, he put together this comprehensive history of the Sea Dart's *design and development.*

One of the most interesting projects undertaken in the evolution of Naval Aviation was the development of the jet-propelled seaplane, culminating in the Convair (Consolidated Vultee Aircraft Corporation) XF2Y-1 *Sea Dart.*

Shortly after WW II, engineers at Convair began work on a water-based, jet fighter design which utilized swept wings for high speed. At rest, the aircraft floated on the lower surfaces of its wings. As power was applied, it rose out of the water to hydroplane on the lower surfaces of the hull. This new twin-engine, subsonic fighter design became known as the "Skate." Convair's hydrodynamic laboratory built jet-powered, radio-controlled models and tested them in San Diego Bay, along with dozens of models and hydro-ski configurations towed by high-speed boats.

At the same time, the National Advisory Committee for Aeronautics (predecessor of today's NASA) was experimenting with a hydro-ski landing gear which appeared to offer some advantages over Convair's blended-wing design. Skis could absorb the pounding of the water during takeoff and landing. Thus, the airframe could be lighter and, since the skis could be retracted, the seaplane would then have the aerodynamic characteristics of its land-based counterpart.

Convair entered the Navy's competition for a water-based interceptor on October 1, 1948, and was chosen to make a comparison study between the blended-hull and hydro-ski approaches. During the study, it was decided to combine these two approaches into one aircraft. By this time, Convair had considerable background and experience in delta wing characteristics from the XF-92A program, then under way for the Air Force. This wing planform, therefore, was chosen for the new aircraft, which was named *Sea Dart.*

On January 19, 1951, the Bureau of Aeronautics issued a contract to Convair for development of a delta-winged, hydro-ski-equipped seaplane with fighter characteristics. Power was to be provided by a pair of afterburning Westinghouse J34-WE-42 engines, with 3,400 pounds of thrust, for initial flights. More powerful engines were to be installed as soon as they became available.

Flight testing of the prototype started in December 1952 and continued through most of 1957. A total of five aircraft, including the prototype, were built. The first was the XF2Y-1, BuNo 137634. The remaining four were YF2Y-1s, BuNos 135762 through 135765, built consecutively. Of these five, only three were flown, since engines were never installed in the last two.

On December 14, 1952, Convair's chief of engineering flight test, E. D. "Sam" Shannon, took the XF2Y-1 *Sea Dart* out into San Diego Bay for its first taxi tests. The aircraft was equipped with small wheels at the aft end of the skis, and a small tail wheel. This enabled the aircraft to taxi up the seaplane ramp under its own power during beaching operations. The same technique was used to enter the water.

The twin hydro-skis were actually planing skis and derived their lift in the same way as water skis. They were not hydrofoils, in the true sense of the word, which provide lift in the same manner as airfoils.

Early taxi tests in San Diego Bay revealed a serious vibration and pounding of the aircraft created by the blunt afterbody of the skis as they traversed wave patterns. The rougher the water, the more serious the vibration, which was amplified by the skis flexing between the front and main oleo struts. These excursions acted like a tuning fork and set up a resonant frequency in the aircraft structure. Since the forward struts of the skis were mounted directly below the cockpit, the combined vibration and pounding reaction loads created completely unacceptable conditions for the pilot and equipment during takeoff and landing.

On January 14, 1953, during a series of taxi tests, the XF2Y-1 made an inadvertent first flight of approximately 1,000 feet after bouncing into the air. The official first flight however, was made four months later by Sam Shannon on April 9, 1953. The ski pounding had been reduced sufficiently, without major ski changes, so that first flight could be accomplished. During the program development, over 100 different ski configurations were tried in an attempt to eliminate the problem but none were completely successful. The first aircraft was painted dark blue with yellow markings, which provided aircraft attitude reference in instrumentation photos of taxi tests, including takeoff and landing.

At idle power settings, Sea Dart taxies on the water as a true flying boat.

Around this time Charles E. Richbourg, another Convair test pilot, had joined the program to assist Shannon in the taxi tests and evaluation of the XF2Y-1. The aircraft was refitted with afterburning Westinghouse J46-WE-12B engines and continued to be used as the primary test bed for twin-ski configuration changes. These modifications were directed towards reducing vibration and pounding loads in the airplane, specifically in the cockpit. Tests on the XF2Y-1 continued through 1953 to mid-1954.

Sea Dart number 2, YF2Y-1 (BuNo 135762), rolled out of the factory in early 1954. The number 2 aircraft, as well as number 3, was similar in configuration to number 1 except for the afterbody on the twin-ski configuration. Charles Richbourg made the initial flights on number 2. He then began to explore the high-speed performance, aerodynamic stability and control characteristics.

Shannon and Richbourg began open sea tests several miles south of Point Loma, Calif., using number 2. The open sea tests involved support and standby rescue boats and auxiliary craft. For safety reasons, at least one helicopter and one chase aircraft were required, and were also used for photo coverage. In addition, recovery tests were conducted with a large Navy landing ship dock to evaluate possible open sea support and service for *Sea Dart*-type aircraft.

Richbourg continued flight and twin-ski tests on number 2 and on August 3, 1954, exceeded Mach 1.0 in a shallow dive at 34,000 feet. Unfortunately, the *Sea Darts* were designed, built and flown before the supersonic "area rule" was first embodied in aircraft design (a method of design for obtaining minimum zero-lift drag at supersonic speeds). High thrust engines were not available at this time and, because of the limited available power (even with the larger engines) and the high transonic drag rise, the anticipated maximum level flight speed was reduced from Mach 1.5 to Mach .99.

A complete redesign of the *Sea Dart* was proposed as the F2Y-2. This aircraft would use a single 15,000-pound thrust Pratt and Whitney J75, or the 12,000-pound thrust Wright J67, and an improved hydro-ski. However, mounting development difficulties were creating questions about the feasibility of the seaplane-fighter concept.

During the summer and fall of 1954, a large single hydro-ski that was not fully retractable was mounted on the XF2Y-1, replacing the twin hydro-skis. This was to become the hydrodynamic test vehicle for the single ski and was to fully demonstrate its practical and suitable use as an operational configuration. There was no need to use this aircraft again for high-performance aerodynamic testing.

Shannon and Richbourg began taxi tests in the late fall of 1954 on the XF2Y-1 with the new single ski and immediately encountered unacceptable hydrodynamic stability and control characteristics.

On November 4, 1954, an event occurred which, along with the other problems exposed during the program, eventually led to the abandonment of the seaplane-fighter concept. During a flight demonstration of the number 2 aircraft for the press, Charles Richbourg was killed when it went into a longitudinal pitch oscillation and disintegrated during the second nose-down pitch. He was performing a low-altitude pass at about 500 knots at the time of the accident. This was a classic example of the divergent pitch oscillation caused by high-speed transonic effects at low altitude, and of early hydraulically-powered flight control system characteristics, which combined to create a situation leading to pilot-induced oscillations. The accident had no bearing on the fact that the *Sea Dart* was a seaplane or that it had any unusual design deficiencies. *Sea Dart* operations were suspended after the crash until the investigation was completed by the Navy accident board. All high-speed aerodynamic testing of the aircraft was subsequently cancelled.

On December 29, 1954, Shannon was scheduled to resume taxi tests on the XF2Y-1, but a mild illness prevented his doing so. Billy Jack "B. J." Long, a chase pilot for the *Sea Dart* program and an experienced seaplane pilot, was cleared by the BuAer representative at Convair to make the test, to avoid any delays. He continued testing the *Sea Dart* until April 1957. Long also flew most of the first tests on configuration changes, the first flight on the number 3 aircraft, and made all important open sea evaluations.

On March 4, 1955, number 3, YF2Y-1 (BuNo 135763), made its first taxi and takeoff test flight. It was equipped with the final twin-ski configuration. This design had wheels that rotated along the tapered afterbody of the skis. Number 3 was to be used for the final evaluation of the optimized twin-ski design changes and to demonstrate possible operational feasibility of the twin-ski configuration, including open sea operations.

The cockpit and canopy of all the *Sea Darts* were very similar to that of the X-15. The field of view out of the small V windshield was poor because outside light was permitted to shine directly on the cockpit consoles and panels, causing glare. The chances of ejecting successfully from the aircraft with that particular canopy arrangement, even at slow airspeeds, were not very good. This would have required modification had the aircraft entered service. Cockpit layout was acceptable except that the beaching wheels did not use conventional toe brakes on the rudder pedals. Instead, there were two side-by-side handles on the right console that had to be hand-pulled separately or together for steering or braking. This beach braking design was unacceptable and unnecessary.

To taxi down the ramp and into the water, the ski oleos were placed in the beach position for attitude purposes. Upon attaining flotation, the main wheels on the ski afterbodies were rotated 90 degrees by an electrical switch and hydraulic action, to place the tapered afterbody of the ski in the proper hydrodynamic position.

At idle, the aircraft's speed was 2 to 3 knots. If the speed brakes on the lower fuselage afterbody were opened and the skis fully extended, speed was reduced to 1 to 2 knots. The speed brakes could be cycled differentially by a switch and by use of rudder pedals for steering at low speeds in the water. Asymmetric power also worked well for steering at low speeds.

Ski positions were selected by an electrical switch on the left console just aft of the throttles. For takeoff, the ski oleos were initially placed in the fully extended position and military power (full power without after-

Sea Dart prepares to land in tests off San Diego.

burner) was applied. This high trim angle caused the leading edges of the skis to break water at 8 to 10 knots. Immediately, the ski oleos were placed in the intermediate position for hydrodynamic drag reduction and the throttles were pushed past the detent into afterburner to commence the takeoff run. It was best to let the aircraft assume a normal pitch attitude up to about 40 or 50 knots, and then select the fully extended position of the oleos. Up through approximately 100 knots, the best attitude for the twin skis was 2 to 5 degrees nose-up. Around 125 knots, the aircraft was sharply rotated nose-up to an attitude of 17 to 19 degrees for lift-off and positive separation from the water. The skis could be retracted immediately like a standard retractable gear.

If proper pilot technique was used, water ingestion in the engines was not a problem. An unusual procedure was developed to handle the baking of salt particles onto the compressor rotor and stator blades. This was a problem to which the J46 was sensitive and the buildup occurred even with only salt particles in the atmosphere. It would quickly cause thrust decay and eventual compressor stalls when attempting to attain high power and afterburner settings. To counter this, small tanks holding approximately 20 gallons of fresh water were installed in the number 1 and 3 aircraft. At idle power and just prior to takeoff, small amounts of fresh water were pumped into the engine air inlet areas to clear the compressor sections of salt contamination. This technique was quite successful and could make the difference between taking off or being towed home.

The engines seldom flamed out due to water ingestion. This could be handled by proper pilot technique; however, if an engine was lost, taxi was impossible because directional control could not be maintained with one engine out.

Twin-ski testing was concluded on April 28, 1955. This was also the last operation for number 3. Before the completion of the project, rocket-assisted takeoff bottles of 1,000 pounds' thrust were attached to number 3. These were used to reduce takeoff distances and the undesirable vibration and pounding loads on the pilot and airframe in open sea tests. During a typical bay takeoff, in a 24-inch wave condition caused by wind, the pilot would experience plus or minus 5.5 Gs at 15 to 17 cycles per second just prior to lift-off. In this environment, he experienced "shotgun" vision and his only facilities were pulling back on the stick and trying to break the throttles off in afterburner position. At this point, nothing was visible in the cockpit because of vibration.

B.J. Long continued single-ski testing of the XF2Y-1 and the twin-ski aircraft, number 3. Single-ski qualities were slowly being improved. Except for being underpowered, the open sea handling qualities of the single-ski aircraft were excellent, considering touchdown speeds of 120 knots and lift-off speeds of 125 knots.

During testing, the Navy required high sink rate landing tests. These were demonstrated in San Diego Bay with sink rates of up to 19 feet per second, with no unacceptable impacts felt in the cockpit and with no damage to the aircraft.

E. D. "Sam" Shannon (inset) made the first flight in the XF2Y-1 on April 9, 1953. Right, Charles E. Richbourg exceeded Mach 1.0 on August 3, 1954, in Sea Dart number 2. He was killed in November when the aircraft disintegrated in flight during a low pass. Far right, B. J. Long made Sea Dart number 3's first flight on March 4, 1955.

On January 16, 1956, final open sea tests of the XF2Y-1 single-ski aircraft were conducted. The purpose of the tests was to demonstrate an upper limit of rough seas for operating the aircraft. Below is B.J. Long's personal description of these tests as told to the Society of Experimental Test Pilots during its meetings, September 22-25, 1976, in Beverly Hills, Calif.

"Special hydrodynamic instrumentation from support vessels provided an accurate plot of the wave patterns during this landing to full stop, taxi back to a near touchdown position, then takeoff for return to San Diego Bay.

"The waves varied from 6 to 10 feet in height with a separation of 50 to 100 feet. Small one to two-foot waves were superimposed on the major wave patterns. A few waves measured 12 feet in height just prior to landing. This sea condition approached a rating of seastate 5. Landing and takeoff were made parallel to the major wave pattern with the 15 to 20-knot wind line about 45 degrees to the right of the aircraft heading.

"Deceleration after a touchdown at 120 knots was rapid. Vertical and lateral motions experienced in the cockpit were severe. My hard hat struck the V windscreen with such impacts in lateral motion that I suddenly tasted what I thought was blood. After forward motion was stopped, I removed my oxygen mask and realized that the impact had forced mucous from my sinuses into my mouth.

"Takeoff bordered on the catastrophic. I overrotated prematurely because of heavy pitching motions which made it appear that I might trip or dive into the heavy sea condition.

"This nose-high attitude kept me from simulating a torpedo, but it also delayed my acceleration so that I kept ricocheting off the tops of waves. The resulting impacts experienced in the cockpit were intolerable. I was stunned. Aircraft test instrumentation recorded one vertical impact of 8.5 Gs at a very high rate of acceleration, under my seat.

"Finally, after the last separation from the water, Lou Hoffman, my friend and chase pilot in an AD-5, yelled for me to come out of afterburner so he could stay with me. The return flight and landing in San Diego Bay were routine."

This flight was the last actual liftoff and landing of any *Sea Dart*. This also completed the single-ski test program and numbers 1 and 3 aircraft were placed in storage until late 1956 when the Bureau of Aeronautics decided to test a small rigidly-mounted hydro-ski on number 1. Because of the placement and rigid mounting of the planing ski, actual takeoff was impossible due to a 17 to 19-degree nose high angle required for lift-off.

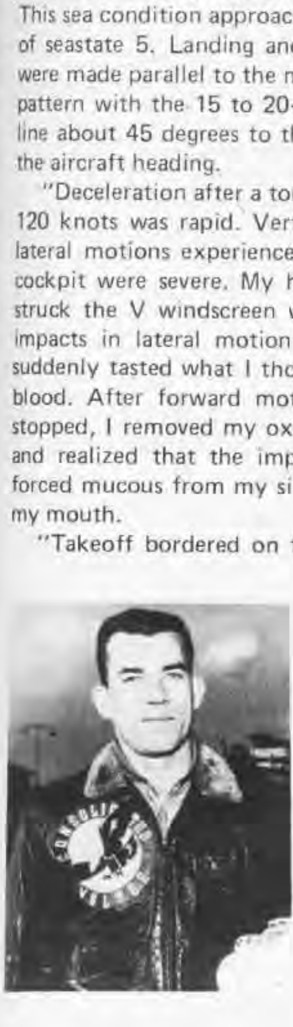
This configuration was tested by Long in April 1957. A speed of more than 50 or 60 knots was never attained because of severe pounding loading in the cockpit. Three test operations in 18 days concluded testing of this configuration. At this point, the three aircraft used in the *Sea Dart* program had performed over 300 test operations, with the XF2Y-1 responsible for about 250 of these.

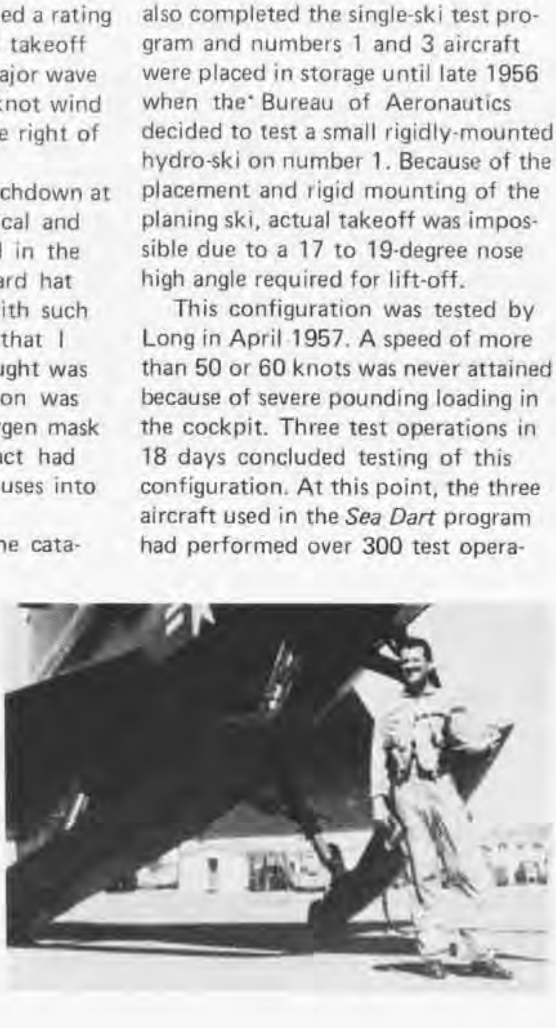
In the fall of 1957, one more small rigid ski configuration was placed on the XF2Y-1 for testing. It was similar to the previous rigid ski but was approximately half the size. This test was conducted by Convair's chief engineering test pilot for Navy, Donald P. Germeraad. His test proved that the ski was unacceptable, as was the other small ski. This ski configuration is still mounted on the XF2Y-1.

Sea Dart development was not continued by the Navy because of the lack of an operational requirement for such an aircraft and the lack of funds. Unfortunately, the *Sea Dart* has been represented as being of poor design or as a partial, if not a total, failure. But some of those knowledgeable about the *Sea Dart* feel that the airplane simply lacked the aerodynamic refinement and power capabilities of aircraft like the F-102A and F-106. Had it been fortunate enough to have this incorporated in its design, it could have provided the Navy with a highly effective, mobile base weapons system. It is interesting to note that the *Sea Dart* was given the designation F-7 nearly six years after its cancellation.

Of all the *Sea Darts* built, numbers 1, 3, 4 and 5 survive. The XF2Y-1 (BuNo 137634) is at the Naval Air Test and Evaluation Museum at Patuxent River, on loan from the Smithsonian's National Air and Space Museum, Washington, D.C. It had been on display in Norfolk, Va.

Number 2 was destroyed in testing in San Diego. Number 3 (BuNo 135763) is on exhibit at Naval Air Station, Willow Grove, Pa. It is stripped inside and displays an inaccurate paint scheme (gold and blue rather than yellow and blue). Number 4, YF2Y-1 (BuNo 135764), is now in outdoor storage at Convair in San Diego. It is slated for eventual restoration and display at the San Diego Aero-Space Museum. It is reported to be in poor condition. Number 5, YF2Y-1 (BuNo 135765), is on display at the SST Museum in Kissimmee, Fla. This aircraft is also inaccurately painted, in white.





TOUCH and GO

Oldies but Goodies Still Flying

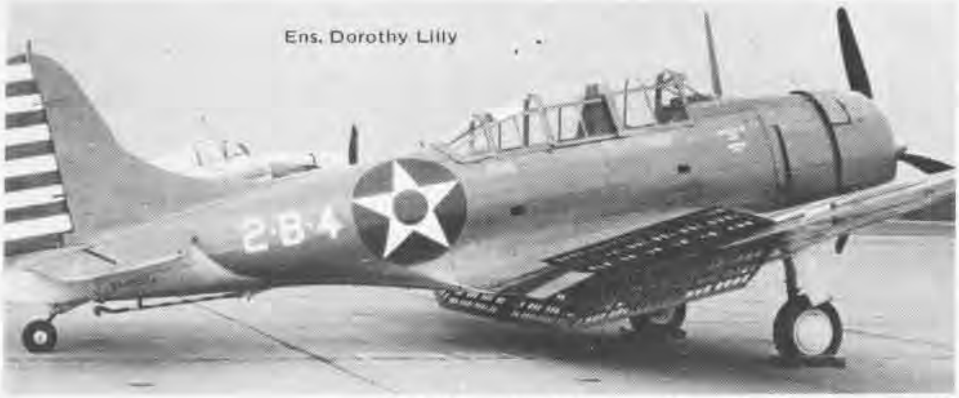
From out of the sultry sky over the Memphis naval air station, two all-but-extinct aircraft closed for a landing. The air over the runway shimmered in the heat, adding to the sense of unreality as a pair of WW II relics materialized and touched down. The arrival of an SBD-5 *Dauntless* divebomber, the very last of its class still flying, and an FM-2 *Wildcat* fighter was an event from out of the past.

The two old aircraft were part of the Confederate Air Force, an organization of aviation buffs who acquire, restore and operate vintage WW II airplanes.

On hand to meet the two aircraft was Joe Dugger, a civilian working for recreational facilities at NAS Memphis, who had flown the SBD-5 during WW II. Dugger recalled cruising in the *Dauntless* at about 10,000 feet and diving at a 65-degree angle to within 300 feet of the target before dropping his bomb and pulling up, despite the fact that the recommended altitude for pulling up was several hundred feet higher.

The former Navy pilot says with pride he could land his bombs within a few feet of a target, and he describes the *Dauntless* as "the most stable divebombing platform the Navy ever had."

Looking at the vintage aircraft, he recalled a time when the skies were less traveled and flying was a serious game of "every man for himself," abiding by visual flight rules. It was somehow a freer and more exhilarating experience, with only God, the laws of nature and a pilot's own resources dictating his movement. And he remarked that those two old planes didn't look old to him. They looked as ready as ever.


Ens. Dorothy Lilly

SBD-5 Dauntless looks as ready as when she flew in WW II.

By Ens. Dorothy Lilly and JO2 Ron Ramsey

Guiding Light from Below

The newly operational guide angle indicator light (GAIL) was a recent factor in successful night operations on Okinawa, teaming Marines from Kilo Company, 3rd Battalion, 4th Marines and HMH-363.

"We practiced with it at Ginoza Dam, Okinawa, and things went pretty well. I would like to work with it on a regular basis," says Captain Timothy Hannigan, K Company's commanding officer.

GAIL is carried in a gray, mount-out-type box and consists of the light and eight box lights to mark the landing zone and approach. It uses three light beams to provide a glide path for the incoming helicopter. The top beam is yellow, the middle one green, and the bottom red.

"It's similar to the system used on aircraft carriers,"


Marine Sgt. Doug Kingery lines up GAIL red beam with clump of trees, to ensure incoming helicopters following green beam will have proper clearance.

explains Capt. Hannigan. "The pilot's job is to keep the helicopter in the green beam."

A pilot following the red beam might hit an obstacle, and using the yellow beam would overshoot the landing zone. The lights are not visible to ground personnel.

Using GAIL in the operation, Marine pilots and crews flying CH-53 *Sea Stallions* picked up and delivered the entire K Company without incident, flying them from the island of Ukibaru, just off the coast, to Ginoza Dam.

"The GAIL system is a sure-fire method of getting choppers into position at night without banging themselves up," says Capt. Hannigan.

Story and photo by LCpl. Ron Appling

In-House Self-Improvement

Major contributions in carrier readiness are being realized through a relatively recent in-house, self-improvement program known as ASMAT.

This increased readiness is reflected in goals recently achieved by Pacific Fleet carriers, including a 70-percent mission capable rating, 60-percent fully mission capable, a pool effectiveness of 95 percent, and less than 200 components awaiting parts.

ASMAT, short for aviation supply management assist team, is the brainchild of Commander Naval Air Forces, U.S. Pacific Fleet. The first team was organized as a pilot program and assigned in 1977 to a carrier to aid in deployment preparations. Successful completion of the assignment and subsequent positive feedback resulted in permanent status.

The mission of the team, as outlined in ComNavAirPac Inst. 4790.22, is to improve overall fleet readiness by intensifying management efforts in the repairables area — with the effort stressing organic support for the carrier, recognizing the impact of actual system shortcomings, and strengthening self-help awareness in repairables.

The team performs its mission aboard the carrier during work-up cycles, and aims at a supervised, on-the-job training effort. The team emphasizes improving the rotatable pool effort and strives to develop standard operating procedures.

Also stressed is the intradependence of the embarked air wing, the aircraft intermediate maintenance department and the supply department in developing successful and accurate indicators of aviation readiness.

There are face-to-face meetings between various personnel, with the benefits and shortcomings of a successful or unsuccessful team effort illustrated from the type commander point of view.

In order to ensure that ship problems and requirements are adequately aired, ASMAT also serves as the devil's advocate on the type commander's staff. Thus, the team acts as a buffer between the ship and staff to prevent adversary situations.

Recognizing that the team could not be aboard the six carriers simultaneously, and to provide a source of continuous reinforcement, ComNavAirPac developed a series of training films dealing with aviation supply and, in particular, repairables management. Response to the films has been positive, and the presentation has even reached inventory control points and systems commands.

Not only has responsiveness to problems of carrier readiness improved but ASMAT has also significantly enhanced the ability of logistics personnel to accurately identify and solve problems. Another benefit has been a flattened learning curve for both aviation stores officers and aviation storekeepers newly thrust into the carrier environment. The overall result has been an improvement in nearly every aspect of readiness throughout the carrier logistics team chain.

AK2 Johnson of Kitty Hawk discusses packaging, labeling and stowage of rotatable pool components with Lt. Daniel Kelly.

By Lt. Daniel C. Kelly, NAS North Island

Letters

Aircraft in the Services

I am a Navy recruiter stationed in Benton Harbor, Mich. In the past several months we have been losing possible recruits to the Air Force. All of these young people want to be in aviation. Since I know that we have the greatest Naval Air Force as well as the greatest Air Force, could I get a breakdown of the number of aircraft each service has? I would greatly appreciate any help, and so would my fellow recruiters, in securing some concrete figures.

RM1 James M. Qualls, Jr.
Navy Recruiting Station
1861-M139 Fairplain Plaza
Benton Harbor, Mich. 49022

Ed's note: As of September 30, 1980, the Navy had 6,300 planes, the Air Force had 7,078, and the Army had 8,500. The figures include the Guard and Reserves.

Nostalgia

The picture of the three F2F-1s in line abreast formation on page 28 of the November issue was of particular interest to me. The pilot of the middle aircraft, 2-F-4, was my father, the late Capt. David B. Young, then a lieutenant. The squadron, VF-2, was attached to the old *Lexington* air group and home-based at NAS North Island.

VF-2 was unique in that the majority of the pilots were Naval Aviation Pilots (NAPs) as were the two wingmen in the photograph. Although not related, both wingmen were named Hoffman. One of these, CPO "Bogey" Hoffman, subsequently left the Navy and was later killed in combat while flying P-40s with the AVG *Flying Tigers*. Many of the pilots attached to VF-2 at the time this photograph was taken went on to complete distinguished careers in Naval Aviation – Admirals "Fish" Moebus, Truman Hedding, "Ducky" Duckworth, Tommy Blackburn and Dean Black.

Capt. David B. Young, USN (Ret.)
5597 Seminary Road, #1710-S
Falls Church, Va. 22041

Hall of Honor

***Top row** – T. G. Ellyson, H. C. Richardson, G. deC. Chevalier, G. H. Curtiss. **Center** – W. A. Moffett, J. H. Towers, P. N. L. Bellinger, F. Bennett. **Bottom row** – R. E. Byrd, A. C. Read, A. A. Cunningham, E. B. Ely.*

Information Needed

I am researching an article to be published in the American Aviation Historical Society *Journal* on Fleet Tactical Support Squadron 21. This will be a comprehensive article on VR-21, or the Pineapple Airlines as we used to call it, including its predecessor squadrons VRJ-1 (April 1945 to November 1946), and VRU-1 (November 1946 to September 1948). These units flew an amazing number and variety of aircraft: PB4Y-1, PB2Y-5Z, many models of the R4D and R5D, a lone P2V-3Z, the TBM-3R, and the later R4Y-1, R6D-1, TF-1/C-1A and C-130.

I would appreciate hearing from any of your readers who would be able to share their memories, scrapbooks, or photos. This article promises to be a fascinating look at Naval Air transport over a 3-decade period, a much neglected subject by today's writers.

Nicholas M. Williams
American Aviation Historical Society
P.O. Box 99
Garden Grove, Calif. 92642

Technical Proficiency Inspection

During October 1980, VP-19, NAS Moffett Field, Calif., completed a sixth consecutive Navy Technical Proficiency Inspection with no discrepancies. This inspection evaluates a squadron's ability to implement an effective nuclear safety program and conduct safe ordnance loading evolutions. It is believed that no other VP squadron on the East or West Coast can make the same claim.

Ltjg. J. E. Jaynes
Public Affairs Officer
VP-19
FPO San Francisco, Calif. 96601

Future Navy Pilot?

Your magazine has changed my opinion as an "Air Force brat" toward Navy people and the Navy in general. Someday my dream of becoming a fighter pilot will come true, but until then I just dream, collect models, posters, pictures and patches. I have a large number of squadron-wing type patches from all over the world given to me by friends. I was wondering if anyone could send me any squadron-ship patches for my collection, especially the aircraft carriers *Nimitz, Eisenhower, Kennedy, Midway* and *Independence*. Thank you very much for any help you can give me.

Joe Brown
7 E. Lamington Road
Hampton, Va. 23669

Correction

In reviewing the list of Change of Commands in the "People, Planes, Places" section of your November 1980 issue, I noticed an error under TraWing-6. Capt. Robert B. Lynch, Jr., relieved Capt. Donald B. Gilbert as C.O. of NAS Pensacola. I am still Commander Training Air Wing 6.

Capt. J. J. Lahr
NAS Pensacola, Fla. 32508

Ed's note: We regret the error.

HAL-3

I am trying to locate former members of HAL-3 who served with the unit in Vietnam. This is for a book on the UH-1/AH-1 *Hueys* in Vietnam. Please write to Helicopters, 10114 Gates Ave., Silver Spring, Md. 20902.

Reunion

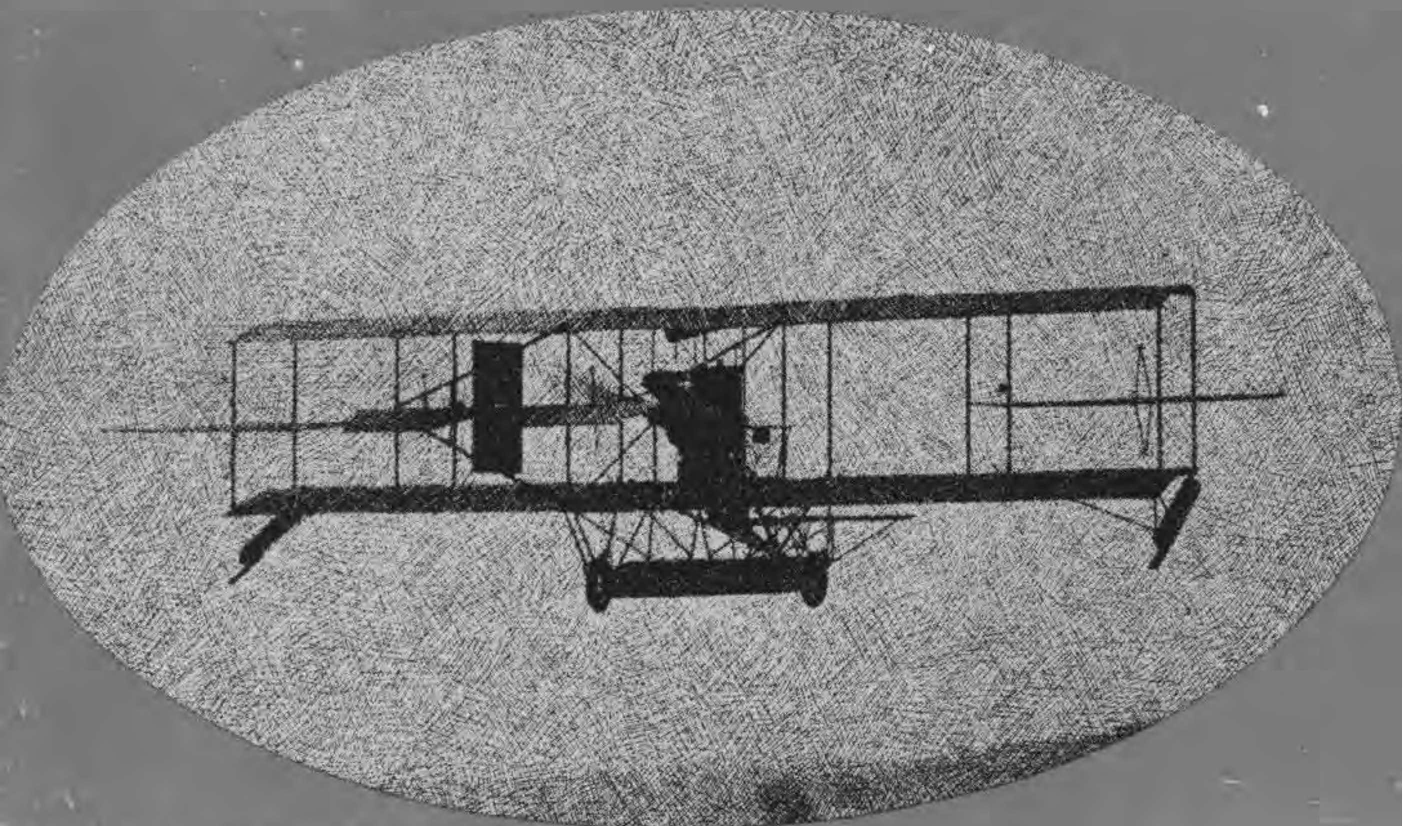
USS *Makassar Strait* (CVE-91) and squadron VC-97 summer reunion in 1981. Please contact Edward J. Devlin, 8654 Jackson Street, Philadelphia, Pa. 19136, (215) 338-9687.

SQUADRON INSIGNIA

Commissioned on February 1, 1956, at NAS Miramar, Attack Squadron 146 has come a long way from operating F9F-8 Cougars to its present A-7E Corsair IIs, equipped with forward looking infrared receiver and strike attack vectoring capabilities. Veterans of 16 WestPac deployments and combat in Southeast Asia, the Blue Diamonds recently deployed to the Indian Ocean under the leadership of skipper Commander L. J. Vernon.

The squadron insignia is composed of a yellow Mach wave, symbolizing the rapid and unyielding penetration and striking power of the A-7E. The four dark blue diamonds set on a sky-blue background stand for professionalism, pride, excellence and squadron unity. The enclosing dark blue ring shows the all-encompassing mission of the light attack community. Whether the mission is strike, electronic warfare, surveillance, tanking or combat air patrol, the Blue Diamonds live up to their motto "Our gimmick is performance."

VA-146



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